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# Draft Environmental Impact Statement for the White Pine Energy Station Project

DES 07-19



Volume 2, Appendixes

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Ely Field Office / Nevada



BLM

## **BLM Mission Statement**

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times.

Management is based upon the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife, wilderness, air and scenic, scientific and cultural values.

## Volume 2

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Appendix A

## Best Management Practices



# Best Management Practices

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This appendix describes a number of Best Management Practices (BMPs) intended to reduce the potential for short- and long-term impacts. These BMPs will be implemented during construction and operation of the White Pine Energy Station. These BMPs will be incorporated into all construction specifications and contract documents, as appropriate, and all contractors will be required to follow them. These BMPs are an integral part of the Proposed Action and Alternative 1.

## Air Pollution Prevention

1. Contractors will be required to comply with all applicable federal, state, and local laws and regulations concerning prevention and control of air pollution during facility construction and operation.
2. Contractors will obtain applicable air quality permits before starting construction or operating equipment that will result in regulated atmospheric emissions.
3. Contractors will be required to implement measures to minimize dust emissions from construction operations. To accomplish this, the following measures will be implemented:
  - For the duration of construction activities, actively disturbed areas will be stabilized through the use of wet suppression as required to meet ambient air quality standards. Adequate supplies of water for dust suppression will be available such that chemical dust suppressants will not be necessary for dust control. Disturbed areas, including storage piles not being actively used for a period of 1 week or longer, will be stabilized as appropriate to minimize dust emissions. Active stabilization may not be required if soil moisture or natural crusting is sufficient to limit ambient impacts.
  - Bulk material stored onsite that is a possible fugitive dust source will be actively wetted, as needed, to minimize ambient impacts. It is anticipated that the majority of the material will be used onsite upon arrival. Should bulk materials require onsite storage for an extended period of time, the application of active wet suppression or the installation of a porous wind fence will be used as necessary to minimize fugitive dust generation.
  - Onsite fugitive dust emissions will be limited by reducing vehicle speeds and a combination of active and passive dust suppression measures. BMPs will include the following:
    - Onsite access roads, parking lots, and lay-down areas will be maintained with a gravel cover or paved to the extent practical.
    - Unpaved road segments will be watered as necessary.

- Traffic on off-site dirt roads will be restricted to the posted speed limit to minimize emissions from unpaved road segments.
  - Combustion emissions from mobile sources will be minimized by proper maintenance and tune-up of equipment.
4. The project will comply with all applicable federal, state, and local laws and regulations concerning prevention and control of air pollution during facility operation. The project will receive a Prevention of Significant Deterioration (PSD) Permit prior to construction that will establish air emission rate limitations and specify air emission control technologies for facility operation.
  5. Air emission sources regulated under the PSD Permit are expected to include the following:
    - Combustion sources
      - Pulverized coal boilers
      - Auxiliary boiler
      - Back-up electric generator(s)
      - Emergency diesel firewater pump
    - Noncombustion particulate matter sources
      - Cooling towers
      - Coal unloading, handling, and storage areas
      - Lime unloading, handling, and storage systems
      - Unpaved and paved roadway travel
      - Solid waste disposal facility operations
    - Liquid fuel storage sources
      - No. 2 fuel oil tank
      - Diesel fuel tanks
      - Gasoline tanks

Air emissions from the sources listed above will be minimized through the design of these sources, use of air pollution control equipment, good combustion practices, and pollution prevention methods, all as specified in the PSD Permit.

## **Landscape Preservation and Impact Avoidance**

1. To the maximum extent practical, all trees, native shrubs, and other vegetation will be preserved and protected during construction operations except where clearing operations are required for structures and equipment, approved construction and permanent roads, construction yards and staging areas, and excavation operations.
2. All areas around water pipelines, wells, and transmission line structures will be backfilled, compacted, and returned as close as possible to the original condition and grade.
3. Ephemeral drainages, steep slopes, or sensitive environmental areas will not be used for equipment or materials storage or stockpiling; construction staging or maintenance; field

offices; hazardous material or fuel storage, handling, or transfer; or temporary access roads.

4. Excavated or graded materials will not be stockpiled or deposited on or within 100 feet of any steep slopes (defined by industry standards) or seasonally active ephemeral drainages.
5. The width of all new temporary access roads will be kept to the absolute minimum needed for operation, avoiding sensitive areas and trees where possible, and limiting disturbance to vegetation.
6. When and where applicable, landscaping standards, including clearing of native vegetation, will be followed as prescribed by local land use and management agencies when work is within their jurisdictions.

## Erosion and Sediment Control

1. Planting of native grasses, forbs, trees, or shrubs beneficial to wildlife, or placing of riprap and other materials as appropriate, will be used to prevent and minimize the potential for erosion and siltation during construction of project features and during the period needed to reestablish permanent vegetative cover on disturbed sites. Sediment fences will be used where appropriate to limit wind and water erosion, and water trucks will be used in disturbed areas during construction to limit wind erosion.
2. Final erosion control and site restoration measures will be initiated as soon as practical after a particular area is no longer needed for construction, stockpiling, or access. Clearing schedules will be arranged to minimize exposure of soils.
3. Cuts and fills for access roads and utility corridors will be sloped to prevent landslides and to facilitate revegetation.
4. Signs will be placed along the access road to discourage off-road vehicle use of adjacent areas.
5. Borrow areas will be contoured and shaped to carry the natural contour of adjacent undisturbed terrain into the borrow area.
6. Soil or rock stockpiles, excavated materials, or excess soil materials will not be placed near sensitive habitats, including perennial, intermittent, and ephemeral drainages, where they may erode into these habitats or be washed away by high water or storm runoff. Plastic will be placed over stockpiles to prevent wind erosion if the stockpiles are intended to be long-term. Waste piles will be revegetated using suitable native species after they are shaped to provide a natural appearance.
7. Treading on areas not immediately involved in project construction activities will be avoided to reduce potential wind erosion and fugitive dust generated during construction.

## Pipeline and Utility Corridor Construction

1. The upper 12 to 18 inches of soil will be removed from the trench area and stockpiled for later use.
2. Surface elevations will be returned to pre-project conditions, taking into account expected settling.
3. Where the pipeline crosses fences, a wire gate will be installed to standard BLM specifications. The gates will be built prior to the corridor construction and will be kept closed except during active construction at the fence site.
4. If construction activities cause damage to existing range improvements (such as pipelines, fences, troughs, etc.), they will be fixed using material that meets or exceeds the quality of the existing improvement. If damage occurs, the BLM and livestock operator will be notified immediately. If damage occurs during active livestock grazing, repairs will be made within 24 hours.
5. The base of guy-wires on power poles will be fenced, and the first 10 feet of guy-wires will be marked with safety reflectors, high-visibility tape or plastic, or a similar material to make them highly visible to the public and to avian and mobile terrestrial wildlife species.

## Biological Resources

1. Biological resources in the project area will be evaluated and the presence of any federally-listed endangered, threatened, or candidate species noted. The U.S. Fish and Wildlife Service (FWS) will be consulted per requirements of Section 7 of the Endangered Species Act (ESA). Measures will be incorporated into the Plan of Development to avoid impacts to endangered, threatened, and candidate species and their habitats. Where such impacts cannot be avoided, the project final design, construction, and operation will include appropriate measures to minimize and mitigate impacts.
2. Bird nests encountered during land disturbing construction activities will be avoided while the birds are fledging. To the extent practical, land disturbing construction activities will be scheduled outside of the breeding season (March 15 through July 30). If construction is required during the breeding season, the area impacted will be surveyed for nests prior to construction.
3. WPEA will adhere to an integrated pest management plan prepared for the project.
4. The evaporation pond on the power plant site will be fenced to exclude access by terrestrial wildlife species. In addition, the pond liner will be textured and there will be wildlife escape ramps at regular intervals on the liner. The evaporation pond will be monitored for water quality, use by wildlife, and possible adverse effects on wildlife resulting from exposure to potentially highly saline pond water. If necessary, measures that are designed to prevent or discourage wildlife from entering the pond will be initiated prior to when critical salinity levels are reached that could adversely impact

wildlife. Examples of such measures include electronic sound devices that mimic predatory bird calls, visual scare tactics, propane noise cannons, and, in extreme cases, netting. The monitoring program and protective measures that will be implemented, if needed, will be described in the Plan of Development. The process will be completed in consultation with a BLM biologist.

5. Also refer to BMPs under Pipeline and Utility Corridor Construction and Reclamation for the protection of Biological Resources.
6. An observer will be present to visually search for and make sure no bald eagles are present in the power plant area prior to steam blowouts.
7. Biological crusts will not be disturbed if encountered.

## **Cultural Resources**

See the Cultural Resources Programmatic Agreement contained in Appendix F.

## **Paleontological Resources**

1. If paleontological resources are discovered during construction, the BLM will be notified immediately and measures taken to protect the resource. A 50-meter buffer will be left around any discovery and work will not resume until authorization is given by an authorized officer. The significance of the resource will be evaluated and whether or not avoidance was possible. Stabilization and measures to mitigate construction damage might also be required even if avoidance was possible. Should avoidance prove infeasible, further procedures to protect the resource will be determined by the BLM.
2. The BLM's Paleontological Resource Management Program (BLM Manual 8720) includes the following objectives:
  - Locate, evaluate, manage, and protect, where appropriate, paleontological resources on public lands.
  - Facilitate the appropriate scientific, educational, and recreational uses of paleontological resources, such as research and interpretation.
  - Ensure that proposed land uses, initiated or authorized by the BLM, do not inadvertently damage or destroy important paleontological resources on public lands.
  - Foster public awareness and appreciation of our nation's rich paleontological heritage.

## **Noxious and Invasive Weed Management**

1. Prior to the acquisition of non-federal lands, a noxious weed assessment will be conducted so that the BLM Authorized Officer can factor the cost of weed control into the acquisition decision.

2. A noxious weed survey will be completed prior to any earth disturbing activity including cross-country travel. Noxious or invasive weeds that may be located on the site will be managed according to methods to be approved by the BLM Authorized Officer. Should chemical methods be approved, the lessee must submit a Pesticide Use Proposal to the Authorized Officer 60 days prior to the planned application date. A Pesticide Application Report must be submitted to the Authorized Officer by the end of each fiscal year following chemical application.
3. To eliminate the introduction of noxious weed seeds, roots, or rhizomes, all straw, hay, straw/hay, or other organic products used for reclamation or stabilization activities will be certified free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Ely Field Office.
4. To eliminate the introduction of noxious weed seeds, roots, or rhizomes, all source sites such as borrow pits, fill sources, or gravel pits used to supply inorganic materials used for construction, maintenance, or reclamation will be inspected and found to be free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Ely Field Office. Inspections will be conducted by a BLM-approved weed scientist or qualified biologist.
5. To eliminate the transport of vehicle-borne weed seeds, roots, or rhizomes, all vehicles and heavy equipment used for the completion, maintenance, inspection, or monitoring of ground disturbing activities will be free of soil and debris capable of transporting weed propagules. All such vehicles and equipment will be cleaned with power or high pressure equipment prior to entering or leaving the work site or project area. Cleaning efforts will concentrate on tracks, feet or tires, and on the undercarriage. Special emphasis will be applied to axles, frames, cross members, motor mounts, on and underneath steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs will be swept out and refuse will be disposed of in waste receptacles. Cleaning sites will be recorded using global positioning systems or other mutually acceptable equipment and provided to the Field Office Weed Coordinator or designated contact person.
6. Prior to entry of vehicles and equipment to a project area, areas of concern will be identified and flagged in the field by a weed scientist or qualified biologist. The flagging will alert personnel or participants to avoid areas of concern. These sites will be recorded using global positioning systems or other Ely Field Office approved equipment and provided to the Field Office Weed Coordinator or designated contact person.
7. Prior to entering public lands, the contractor, operator, or permit holder will provide information and training regarding noxious weed management and identification to all personnel who will be affiliated with the implementation and maintenance phases of the project. The importance of preventing the spread of weeds to uninfested areas and the importance of controlling existing populations of weeds will be explained.
8. To eliminate the transport of soil-borne noxious weed seeds, roots, or rhizomes, infested soils or materials will not be moved and redistributed on weed-free or relatively weed-free areas. In areas where infestations are identified or noted and infested soils, rock, or overburden must be moved, these materials will be salvaged and stockpiled adjacent to

the area from which they were stripped. Appropriate measures will be taken to minimize wind and water erosion of these stockpiles. During reclamation, the materials will be returned to the area from which they were stripped.

9. Prior to project approval, a site-specific weed survey will occur and a weed risk assessment will be completed. Monitoring will be conducted for a period no shorter than the life of the permit or until bond release and monitoring reports will be provided to the BLM. If the spread of noxious weeds is noted, appropriated weed control procedures will be determined in consultation with BLM personnel and will be in compliance with the appropriate BLM Handbook sections and applicable laws and regulations. All weed control efforts on BLM-administered lands will be in compliance with BLM Handbook H-9011, H-9011-1 Chemical Pest Control, H-9014 Use of Biological Control Agents of Pests on Public Lands, and H-9015 Integrated Pest Management. A pesticide Application Report must be submitted to the Authorized Officer by the end of the fiscal year follow chemical application.
10. For mineral activity, bonds for weed control will be retained until the site is returned to desired vegetative conditions.
11. Removal and disturbance of vegetation will be kept to a minimum through construction site management (e.g. using previously disturbed areas and existing easements, limiting equipment/materials storage and staging area sites, etc.)
12. Mixing of herbicides and rinsing of herbicide containers and spray equipment will be conducted only in areas that are safe distance from environmentally sensitive areas and points of entry to bodies of water (storm drains, irrigation ditches, streams, lakes, or wells).
13. Methods used to accomplish weed and insect control objectives will consider seasonal distribution of large wildlife species.

## Reclamation

1. Reclamation will normally be accomplished with native species only. These will be representative of the indigenous species present in the adjacent habitat. Rationale for potential planting with selected non-natives will be documented. Possible exceptions could include use of non-natives for a temporary cover crop to out-compete weeds.
2. Seeding will occur during October 15 through March 15 to ensure a greater chance of success.
3. Reclamation release criteria are as follows:
  - Achieve 100 percent of the perennial plant cover of selected comparison areas, normally like adjacent habitat. If the adjacent habitat is severely disturbed, a range site description may be used as a cover standard. Cover is normally crown cover as estimated by the point intercept method. Selected cover can be determined using a method as described in *Sampling Vegetation Attributes, Interagency Technical Reference* (1996, BLM/RS/ST-96/002+1730). The reclamation plan for the project area will

identify the site-specific release criteria and associated statistical methods in the reclamation plan or permit.

- No noxious weeds will be allowed on the sites for reclamation release. Control of noxious weeds will follow an integrated pest management plan approved by the authorizing officer. A list of Nevada noxious weeds will be provided by the authorized officer.
4. Up to the first 12 to 18 inches of growth medium will be salvaged and stockpiled prior to disturbance for all areas to be reclaimed after construction. All disturbance areas to be reclaimed will be recontoured to blend as nearly as possible with the natural topography prior to revegetation. All compacted portions of the disturbance will be ripped to a depth of 12 inches unless solid rock is encountered. Adequate, fine-grain seedbed must be established to provide good seed to soil contact. Large blocks and clumps of soil with deep pockets should be avoided. This normally requires some type of tillage procedure after ripping.
  5. All portions of access roads not needed for other uses as determined by the authorized officer will be reclaimed.
  6. Mulching of the seedbed following seeding may be required under certain conditions, such as severe erosion.
  7. The success of the vegetative growth on a reclaimed site may be evaluated for release no sooner than during the third growing season after earthwork and planting have been completed. Where it has been determined that revegetation success criteria have not been met, the agencies and the operator will meet to decide on the best course of actions necessary to meet the reclamation goal.
  8. Where applicable, the following agencies will be consulted to determine the recommended plant species composition, seeding rates, and planting dates:
    - U.S. Fish and Wildlife Service (FWS)
    - U.S. Natural Resources Conservation Service (NRCS)
    - U.S. Bureau of Land Management (BLM)
  9. Grasses, forbs, shrubs, and trees appropriate for site conditions and surrounding vegetation will be included on the plant list. Species chosen for a site will be matched for site drainage, climate, shading, resistance to erosion, soil type, slope, aspect, and vegetation management goals. Upland revegetation shall match the plant list to the site's soil type, topographic position, elevation, and surrounding natural communities.
  10. Construction areas, including storage yards, will be free of waste material and trash accumulations at all times, unless stored in appropriate containers.
  11. All unused materials and trash will be removed from construction and storage sites during the final phase of work. All removed material will be placed in approved sanitary landfills or storage sites and work areas will be left to conform to the natural landscape.

12. Upon completion of construction, any land disturbed will be graded to provide proper drainage and blend with the natural contour of the land. Following grading, it will be revegetated using plants native to the area, suitable for the site conditions, and beneficial to wildlife.
13. Following completion of construction, all yards, offices, and construction buildings, including concrete footings and slabs, will be removed from the site.
14. All temporary construction roads will be obliterated and restored to the original contour, and made to discourage vehicular traffic when no longer needed by contractors. Culverts will be removed as appropriate, road escarpments will be contoured and vegetated, and all road surfaces will be scarified to establish conditions appropriate for reseeding, drainage, and erosion prevention.

## Visual Resources

1. All outside surfaces of structures, stacks, buildings, and tanks will be constructed of materials that will restrict glare, and will be finished with flat tones intended to blend with the surrounding predominantly rural environment. WPEA will consult with White Pine County and BLM regarding the final selection of colors for the features of the property.
2. All fencing will be constructed of non-reflective materials, and will be treated or painted to blend with the surrounding environment.
3. Signs at the plant site will be constructed of materials that are non-glare, and will be painted using unobtrusive colors. This requirement shall not apply to safety signs (e.g., brightly colored signs indicating the presence of a hazard.)
4. Outdoor lighting will be limited to areas required for operations, maintenance, safety and security, and will be shielded and directed downward to the extent possible. Highly directional, high-pressure sodium vapor fixtures (or other fixtures that meet the criteria specified) will be used where practical. Switches will be used as appropriate on outdoor lighting to allow use of lighting only when needed. Lighting techniques will include using directional lights that do not allow lights to shine into the sky, screening lights, using timers and motion detectors so that lights are only on when necessary, and designing a lighting system than minimizes lighting to only meet functional requirements.
5. The transmission structures will be finished with flat, neutral gray tones that will relate to the colors of the structures in the existing transmission corridors and that will blend with the surrounding environment.
6. Non-specular conductors and non-reflective and non-refractive insulators will be used to reduce conductor and insulator visibility.
7. Also refer to BMP No. 5 under Pipeline and Utility Corridor Construction for Visual Resources guidelines.

## Water Pollution Prevention and Monitoring

1. Water needs during facility operation (up to 5,000 acre-feet annually) will be supplied through water rights that have been permitted under application Numbers 45834 through 45855 and are held by White Pine County. Water needs during facility construction will be supplied by one or more of the project's permitted wells or transported by truck from other local water sources.
2. A ground water monitoring program will be developed by WPEA in cooperation with the Nevada State Engineer. Results of monitoring will be provided to the BLM and the Nevada State Engineer annually to evaluate the effects of the withdrawal of ground water resources in accordance with Condition 3 of the water rights permits.
3. Pumped ground water will be monitored periodically (as stipulated in the final Construction, Operation, and Maintenance Plan) to ensure its quality is suitable for power plant operation, including its use as potable water supplies for plant employees, boiler feedwater makeup, cooling water makeup, pollution control, and other beneficial uses to support the operation of the facility.
4. All federal and state laws related to control and abatement of water pollution will be complied with. All waste material and sewage from construction activities or project-related features will be disposed of according to federal and state pollution control regulations.
5. All disturbed drainages will be reclaimed as soon as practical, to a standard for aesthetic value comparable to what existed prior to disturbance. Where appropriate, native species capable of bank stabilization will be used to revegetate all disturbed banks.
6. Diversion structures will be used to re-direct flows from any drainages potentially impacted by facility features and will be designed to minimize potential destabilization and erosion of adjacent and downgradient drainages.
7. Stormwater management plans will be implemented for project construction and facility operation to minimize and control erosion from stormwater runoff. During project construction, stormwater will be managed in compliance with applicable state and federal regulations, including compliance with requirements of the National Pollutant Discharge Elimination System (NPDES) stormwater general permits, which will be obtained for the project. Stormwater management elements will include:
  - Application of best management practices for erosion, sedimentation, and stabilization control during construction activities, and management of oils and other substances during operation to minimize contact with stormwater
  - Structural controls during operation that could include stabilized stormwater conveyance systems (swales), oil-water separators for runoff that comes in contact with affected plant site surfaces, and sedimentation detention basins
  - Monitoring and maintenance to ensure long-term effectiveness of the management system.

8. One or more stormwater retention basins will be constructed with sufficient dimensions to accommodate runoff from the impervious surfaces at the plant site generated by the local maximum daily rainfall event with a return frequency of 100 years or less. All runoff from the impervious surfaces will be directed to the retention basin(s) prior to being released to the natural drainage system at flow rates equivalent to pre-development conditions. Stormwater runoff likely to contain contaminants will flow first to onsite treatment facilities (such as an oil-water separator), as appropriate, prior to being directed to the stormwater retention basin(s).
9. Construction specifications will require construction methods that prevent pollutants from accidentally entering or spilling into flowing or dry watercourses, and ground water sources. Potential pollutants and wastes include refuse, garbage, cement, concrete, sewage effluent, industrial waste, oil and other petroleum products, aggregate processing tailings, mineral salts, drilling mud, and thermal pollution.
10. A detailed containment plan will be developed and included in the Plan of Development for the disposal of drilling mud and test-drilling water associated with and removed during the drilling of ground water wells.
11. Any construction wastewater discharged into surface waters will be essentially free of settling material. Wastewater from aggregate processing, concrete batching, or other construction operation will not enter drainages without water quality treatment. Turbidity control methods may include settling ponds; gravel-filter entrapment dikes; recirculation systems for washing aggregates; or other approved methods.
12. Appendix I contains a ground water monitoring program.

## **Noise Prevention**

1. The facility will be designed to operate in compliance with all applicable federal, state, and local laws and regulations related to noise.
2. Contractors will be required to comply with all applicable federal, state, and local laws and regulations concerning prevention and control of noise during project construction and operation.

## **Hazardous Material Storage, Handling, and Disposal and Safety Measures**

1. Contractors will be required to comply with Nevada State Regulations established under the authority of the Federal Resources Conservation and Recovery Act of 1976.
2. "Hazardous material" means any substance, pollutant, or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 USC 9601 et seq., and its regulations (CERCLA). The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act of 1976 (RCRA), as amended 42 USC 6901 et seq., and its regulations. The term hazardous materials also includes any

nuclear byproduct material as defined by the Atomic Energy Act of 1954 as amended, 42 USC 2011 et seq.

3. As necessary, process wastewater solid precipitant will be transported for disposal at a licensed landfill. Solid precipitant stored onsite will be covered until transported for disposal.
4. Aboveground chemical tanks will be located within a containment structure that is paved and bermed, and that is sufficient to contain a release from the largest tank within the area, plus sufficient freeboard to prevent overflow. Tanks will be registered, constructed, and managed using accepted engineering best practices, which may include high-level alarms or indicators to prevent overflow and locking valves. Tanks will be subject to a regular inspection regime (as stipulated in the final Construction, Operation, and Maintenance Plan).
5. The potential for adverse impacts from oil and fuel spills will be reduced through careful handling and designation of specific equipment repair and fuel storage areas.
6. Outdoor oil storage areas will be bermed with a capacity sufficient to contain the oil inventory contained in the single largest tank/equipment plus sufficient freeboard to prevent overflow. These areas will be equipped with a normally locked valve. Regular inspections will determine if there had been a leak requiring special attention. Otherwise, the valve will be opened to drain any rainwater to a plant oil/water separator. Any oil collected in the separator will be pumped out and removed by a licensed oil disposal contractor.
7. Outdoor chemical and hazardous waste storage areas will be within diked containment areas. Chemicals and wastes will be stored in accordance with the fire safety, hazardous materials management, and hazardous waste management standards of practice, which include segregation of incompatibles, protection of water-reactive materials from precipitation or moisture, adequate aisle space, etc.
8. Waste materials known or found to be hazardous will be disposed of in approved treatment or disposal facilities in accordance with federal, state, and local regulations, standards, codes, and laws.
9. Solid waste will be stored in onsite roll-off bins. Recyclable materials will be separated from the solid waste stream. Solid waste will be collected periodically and transported to a local licensed landfill.
10. Generation of wastes during construction will be minimized through detailed estimating of materials needed and through efficient construction practices. Any wastes generated during construction will be recycled as much as feasible. Concrete waste will be used as fill onsite, or, if not suitable for reuse, will be removed to a local licensed landfill. Any nonrecyclable wastes will be collected and transported to a local licensed landfill.
11. Fuels, lubricant chemicals, and welding gases used during construction will be in controlled storage until used. Any empty containers or waste material will be segregated in storage and properly recycled or disposed of by licensed handlers.

12. Concrete trucks will not be washed at construction sites along utility corridors. Concrete trucks may be washed at designated locations on the power plant site. All spilled concrete will be removed from construction areas and disposed of properly.
13. Portable toilets will be provided for onsite sewage handling during construction. Sewage from the portable toilets will be removed regularly and disposed of in accordance with applicable federal and state pollution control regulations. During facility operation, sewage from plant employees will be collected and treated using an on-site septic system.
14. A Spill Prevention Control and Countermeasures Plan (SPCCP) will be put in place for project features and include the following:
  - Program components and assignments
  - Professional engineer certification
  - Site information
  - Site drainage and storm water management
  - Emergency procedures/spill response
  - Emergency reporting contacts
  - Tank schematics
  - Material safety data sheets
  - Management approval
  - Plans reviews and amendments
  - Personnel training
  - Reporting procedures/emergency reporting contacts
  - Site inspections
  - Notice to tank truck drivers
  - Spill, fire, and safety equipment
15. Operators of the White Pine Energy Station will provide first response fire and emergency medical equipment and services for the project. The operators will also coordinate with local police, fire, and ambulance districts to provide additional personnel and services to the project.
16. To minimize the exposure of personnel and equipment to potential flood hazards, construction activities in or immediately adjacent to drainages will be scheduled to occur when the probability for flash flooding is minimal.

## **Socioeconomics**

1. WPEA will provide funding for the additional resources, if needed, that will be identified by White Pine County so that there are no interim service deficiencies.
2. Security-related BMPs included as part of the plant site development will include an onsite security office to provide space and facilities for security personnel, a guardhouse for security personnel at the entrance to the power plant site, security fencing around the power plant site, and security vehicles to patrol the site.
3. Speed limit and caution signs will be placed near construction sites and access routes.

4. Traffic control personnel will be employed at road crossings and construction access ingress and egress sites to minimize the potential increase in demand for sheriff patrols and reduce the need for issuing speeding tickets.
5. To support the effectiveness of first responders the plant site will have extra water storage for firefighting effort that might be necessary prior to firefighting personnel arrive from McGill or Ely can arrive. Backup diesel generators and pumps, water trucks, and other equipment will also be maintained and kept on the plant site.
6. The plant site will incorporate a wide range of safety features to minimize the risk of injury that could require medical attention including:
  - Public access to the power plant site will be restricted through the use of fencing and security gates
  - The power plant will be equipped with fire suppression systems
  - Industry-recognized BMPs will be implemented to minimize fire safety risks

Appendix B  
**Wetlands**



## APPENDIX B

# Wetlands

Because USACE jurisdictional determinations are yet to be made for the study area, all areas identified in the following table are potential USACE jurisdictional wetlands or potential Waters of the United States.

USACE Non-Jurisdictional Wetlands (unshaded rows), USACE Jurisdictional Wetlands (shaded gray rows) and Waters of the United States, and NDEP-Sensitive Waters in the White Pine Energy Station Project Area

Project Components/ Wetlands <sup>1</sup>	USACE Non- jurisdictional Wetlands (acres)	USACE Jurisdictional Wetlands (acres)	Total (acres)
<b>Proposed Action</b>			
Preferred Rail Spur ROW			
RSP1 AM 1a, 1b jw		40.5	40.5
RSP1 RM 1 njw	20.4		20.4
RSP1 WM 1a jw		0.23	0.23
<b>RSP Total</b>	<b>20.4</b>	<b>40.8</b>	<b>61.1</b>
Preferred SWIP ROW			
SP1 AM 1a, 1b, 1c jw		58.6	58.6
SP1 RM 1a, 1b njw	13.9		13.9
SP1 WM 1a, 1b jw		27.11	27.11
<b>SP Total</b>	<b>13.9</b>	<b>85.7</b>	<b>99.6</b>
Preferred Water Pipeline			
WPP1 RM 1 njw	2.5		2.5
<b>Proposed Action Total</b>	<b>36.8</b>	<b>126.5</b>	<b>163.3</b>
<b>Alternative 1</b>			
Alternative 1 Rail Spur ROW			
RSA1 WM 1 jw		4.8	4.8
RSA2 WM 1 jw		0.62	0.6
RSA3 RM 1 njw	0.06		0.1
RSA4 RM 1 njw	0.21		0.2
RSA5 RM 1 njw	0.15		0.1
RSA6 AM 1a,1b jw		0.61	0.67
RSA6 RM 1a,1b,1c,1d njw	1.4		46.80
RSA6 WM 1a,1b jw		1.7	5.32
<b>RSA6 total</b>	<b>46.8</b>	<b>6.0</b>	<b>52.8</b>
<b>RSA Total</b>	<b>47.2</b>	<b>11.4</b>	<b>58.6</b>
Alternative 1 SWIP ROW			
SA1 AM 1a,1b,1c,1d jw		48.84	48.84
SA1 AM 1e,1f,1g njw	7.21		7.21
SA1 RM 1a,1b,1c,1d njw	56.78		56.78
SA1 WM 1a,1b jw		30.13	30.13
<b>SA Total</b>	<b>64.0</b>	<b>79.0</b>	<b>143.0</b>
Alternative 1 Water Pipeline			

USACE Non-Jurisdictional Wetlands (unshaded rows), USACE Jurisdictional Wetlands (shaded gray rows) and Waters of the United States, and NDEP-Sensitive Waters in the White Pine Energy Station Project Area

<b>Project Components/ Wetlands<sup>1</sup></b>	<b>USACE Non- jurisdictional Wetlands (acres)</b>	<b>USACE Jurisdictional Wetlands (acres)</b>	<b>Total (acres)</b>
WPA1 AM 1a,1b njw	0.29		0.29
WPA1 RM 1a,1b njw	7.17		7.17
<b>WPA1 total</b>	<b>7.5</b>		<b>7.5</b>
WPA2 AM 1a,1b njw	0.51		0.51
WPA2 RM 1 njw	3.8		3.8
<b>WPA2 total</b>	<b>4.3</b>		<b>4.3</b>
WPA3 AM 1a njw	1.3		1.3
WPA3 AM 1b,1c jw		19.6	19.6
WPA3 RM 1a,1b,1d,1e njw	6.81		6.81
WPA3 RM 1c jw		2.0	2.0
WPA3 WM 1a jw		1.5	1.5
<b>WPA3 total</b>	<b>8.1</b>	<b>23.1</b>	<b>31.2</b>
WPA4 RM 1 njw	6.6		6.6
WPA5 WM 1 njw	0.02		0.0
WPA6 RM 1 njw	0.04		0.0
WPA7 RM 1 njw	0.37		0.4
WPA8 RM 1a,1b njw	3.1		3.1
WPA9 AM 1 jw		0.26	
WPA9 RM 1 njw	4.1		
<b>WPA9 total</b>	<b>4.1</b>	<b>0.3</b>	<b>4.4</b>
<b>WPA Total</b>	<b>34.2</b>	<b>23.4</b>	<b>57.5</b>
<b>Alternate 1 Total</b>	<b>145.4</b>	<b>113.8</b>	<b>259.1</b>
<b>Wetland Totals</b>	<b>182.1</b>	<b>240.3</b>	<b>422.4</b>

USACE Drainages			
Other Waters of the U.S.	Ephemeral/Swale-like Drainages	Acreage	Number
<b>Duck Creek Segments<sup>2</sup></b>			
rsp26-jd – intermittent		2.014	1
sp58-jd – intermittent		7.166	1
sa12-jd – intermittent		8.844	1
sa11-jd – intermittent		0.926	1
<b>Schell Creek Segments</b>			
wpp90-jd – perennial		0.206	1
wpp89-jd – intermittent		0.116	1
<b>Total</b>		<b>19.273</b>	<b>6</b>
<b>NDEP Sensitive Surface Waters<sup>3</sup></b>			
<b>NDEP Drainage<sup>4</sup></b>			<b>Numbers<sup>5</sup></b>
	60		66

<sup>1</sup>. rsa = rail spur alternative 1, rsp = rail spur preferred alternative, wpa = water pipeline alternative 1, wpp = water pipeline preferred alternative, SA = SWIP transmission line alternative 1, SP = SWIP transmission line preferred alternative. WM = wet meadow, AM = alkali meadow, RM = rabbitbrush meadow, jw = jurisdictional wetland, njw = non-jurisdictional wetland. 1a, 1b, 1c - individual wetland polygons.

<sup>2</sup>. Includes 3 mainstem sections of Duck Creek and one side channel.

<sup>3</sup>. USACE jurisdictional wetlands are also NDEP jurisdictional sensitive habitats = 240.3 acres.

<sup>4</sup>. Drainages with potential for water quality impairment from construction-related ground disturbances.

<sup>5</sup>. Acreages were not calculated for the 60 ephemeral and swale-like drainages since several do not contain an ordinary high water mark (OHWM) normally used to calculate acreages (for USACE jurisdiction).



Appendix C

**Biological Resources Supplemental Information**



# Biological Resources Supplemental Information

This appendix contains four sections as follows:

- A table listing the common and scientific names used in this document (Table C-1)
- A table listing wildlife observed and with high potential to occur in the WPES project area (Table C-2)
- Background information on flora and fauna and on Threatened, Endangered, Candidate, and Sensitive Species
- Risk Assessment for Noxious/Invasive Weeds

TABLE C-1  
Common and Scientific Names

Common Name	Scientific Name
<b>Plants</b>	
African rue	<i>Peganum harmala</i>
alkali bluegrass	<i>Poa juncifolia</i>
alkali cordgrass	<i>Spartina gracilis</i>
alkali sacaton	<i>Sporobolus airoides</i>
American kochia	<i>Kochia scoparia</i>
antelope bitterbrush	<i>Purshia tridentata</i>
Austrian fieldcress	<i>Rorippa austriaca</i>
Austrian peaweed	<i>Sphaerophysa salsula</i> / <i>Swainsona salsula</i>
Baltic rush	<i>Juncus balticus</i>
basalt springparsley	<i>Cymopterus basalticus</i>
basin big sagebrush	<i>Artemisia tridentata</i> var. <i>tridentata</i>
black henbane	<i>Hyoscyamus niger</i>
black sagebrush	<i>Artemisia nova</i>
broad-pod freckled milkvetch	<i>Astragalus lentiginosus</i> var. <i>latus</i>
broom snakeweed	<i>Gutierrezia sarothrae</i>
budsage	<i>Artemisia spinescens</i>
bur buttercup	<i>Ranunculus testiculatus</i>
bushy blazingstar	<i>Mentzelia dispersa</i>
camelthorn	<i>Alhagi camelorum</i>
Canada thistle	<i>Cirsium arvense</i>
Carolina horse-nettle	<i>Solanum carolinense</i>
cattail	<i>Typha latifolia</i>

TABLE C-1  
Common and Scientific Names

Common Name	Scientific Name
cheatgrass	<i>Bromus tectorum</i>
clustered field sedge	<i>Carex praeegracilis</i>
common crupina	<i>Crupina vulgaris</i>
common dandelion	<i>Taraxacum officinale</i>
creeping spikerush	<i>Eleocharis cf. palustris</i>
curl-leaf mountain mahogany	<i>Cercocarpus ledifolius</i>
cushion buckwheat	<i>Eriogonum ovalifolium</i>
cushion stenotus	<i>Stenotus acaulis</i>
dainty moonwort	Dainty moonwort
dainty moonwort	<i>Botrychium crenulatum</i>
dalmation toadflax	<i>Linaria dalmatica</i>
desert paintbrush	<i>Castilleja chromosa</i>
diffuse knapweed	<i>Centaurea diffusa</i>
dusty maidens	<i>Chaenactis douglasii</i>
Dyer's woad	<i>Isatis tinctoria</i>
Eastwood milkweed	<i>Asclepias eastwoodiana</i>
Eurasian water-milfoil	<i>Myriophyllum spicatum</i>
fiddleneck hawkweed	<i>Crepis runcinata</i>
field bindweed	<i>Convolvulus arvensis</i>
flixweed	<i>Descurainia sophia</i>
fourwing saltbrush	<i>Atriplex canescens</i>
giant reed	<i>Arundo donax</i>
giant salvinia	<i>Salvinia molesta</i>
goats rue	<i>Galega officinalis</i>
gray rabbitbrush	<i>Chrysothamnus nauseosus</i>
greasewood	<i>Sarcobatus vermiculatus</i>
Great Basin wildrye	<i>Leymus cinereus</i>
green fountain grass	<i>Pennisetum setaceum</i>
green rabbitbrush	<i>Chrysothamnus viscidiflorus</i>
hanging bladderpod	<i>Lesquerella pendula</i>
hoary cress	<i>Cardaria draba</i>
Holmgren buckwheat	Holmgren buckwheat
Holmgren buckwheat	<i>Eriogonum holmgrenii</i>
hornwort	<i>Ceratophyllum</i> spp.
houndstongue	<i>Cynoglossum officinale</i>
Iberian star thistle	<i>Centaurea iberica</i>

TABLE C-1  
Common and Scientific Names

Common Name	Scientific Name
Indian ricegrass	<i>Achnatherum hymenoides</i>
inland saltgrass	<i>Distichlis spicata</i>
Johnson grass	<i>Sorghum halepense</i>
Klamath weed	<i>Hypericum perforatum</i>
leafy spurge	<i>Euphorbia esula</i>
Lemmon's rubberweed	<i>Hymenoxys lemmonii</i>
low sagebrush	<i>Artemisia arbuscula</i>
lupine	<i>Lupinus argenteus</i>
Malta star thistle	<i>Centaurea melitensis</i>
matted buckwheat	<i>Eriogonum caespitosum</i>
mayweed chamomile	<i>Anthemis cotula</i>
meadow milkvetch	Meadow milkvetch
meadow milkvetch	<i>Astragalus diversifolius</i>
Mediterranean sage	<i>Salvia aethiopis</i>
medusahead	<i>Taeniatherum caput-medusae</i>
milkvetch	<i>Astragalus</i> spp.
Mojave seablite	<i>Suaeda moquinii</i>
Monte Neva Indian paintbrush	<i>Castilleja salsuginosa</i>
Monte Neva paintbrush	<i>Castilleja salsuginosa</i>
Monte Verde paintbrush	<i>Castilleja salsuginosa</i>
Mormon tea	<i>Ephedra viridis</i>
Mount Wheeler sandwort	<i>Arenaria congesta</i> var. <i>wheelerensis</i>
mountain big sagebrush	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>
mountain mahogany	<i>Cercocarpus montanus</i>
musk thistle	<i>Carduus nutans</i>
mustards	<i>Descurainia</i> spp.
Nachlinger catchfly	<i>Silene nachlingerae</i>
Nevada primrose	<i>Ericameria watsoni</i>
nodding thelypody	<i>Thelypodium flexuosum</i>
non-native invasive cheatgrass	<i>Bromus tectorum</i>
Parish phacelia	<i>Draba pedicellata</i>
Pennell beardtongue	<i>Penstemon leiophyllus</i> var. <i>francisci-pennellii</i>
Pennell draba	<i>Draba pennellii</i>
pepperweed	<i>Lepidium perfoliatum</i>
perennial pepperweed	<i>Lepidium latifolium</i>
pinnate tansymustard	<i>Descurainia pinnata</i>

TABLE C-1  
Common and Scientific Names

Common Name	Scientific Name
pinyon	<i>Pinus monophylla</i>
poison hemlock	<i>Conium maculatum</i>
pondweed	<i>Potamogeton</i> spp.
Poverty sumpweed	<i>Iva axillaries</i>
poverty weed	<i>Iva axillaris</i>
prickly lettuce	<i>Lactuca serriola</i>
puncture vine	<i>Tribulus terrestris</i>
purple loosestrife	<i>Lythrum salicaria</i> , <i>L. virgatum</i> , and their cultivars
purple star thistle	<i>Centaurea calcitrapa</i>
rush skeletonweed	<i>Chondrilla juncea</i>
rushes	<i>Juncus</i> spp.
Russian knapweed	<i>Acroptilon repens</i>
Russian thistle	<i>Salsola kali</i>
Russian thistle	<i>Salsola iberica</i>
salt cedar (tamarisk)	<i>Tamarix</i> spp.
salt grass	<i>Distichlis spicata</i>
saltlover	<i>Halogeton glomeratus</i>
sand cholla	<i>Opuntia pulchella</i>
Sandberg bluegrass	<i>Poa secunda</i>
Scotch thistle	<i>Onopordum acanthium</i>
shadscale	<i>Atriplex confertifolia</i>
shadscale spring parsley	Shadscale spring parsley
silverweed	<i>Potentilla anserine</i>
Snake Range whitlowcress	<i>Draba oreibata</i> v. <i>serpentine</i>
snowberry	<i>Symphoricarpos</i> sp.
sow thistle	<i>Sonchus arvensis</i>
spikerush	<i>Eleocharis</i> spp.
spiny hopsage	<i>Grayia spinosa</i>
spotted knapweed	<i>Centaurea maculosa</i>
squarrose knapweed	<i>Centaurea virgata</i> Lam. ssp. <i>squarrosa</i>
squirreltail	<i>Elymus elymoides</i>
stalked whitlow cress	<i>Draba pedicillata</i>
straight-leaf rush	<i>Juncus</i> cf. <i>orthophyllus</i>
sulphur cinquefoil	<i>Potentilla recta</i>
Sunnyside green gentian	<i>Frasera gypsicola</i>
Syrian bean caper	<i>Zygophyllum fabago</i>

TABLE C-1  
Common and Scientific Names

Common Name	Scientific Name
thickspike wheatgrass	<i>Elymus lanceolatus</i>
Thurber's needlegrass	<i>Achnatherum thurberiana</i>
tumble mustard	<i>Sisymbrium altissimum</i>
Tunnel Springs beardtongue	<i>Penstemon concinnus</i>
Utah juniper	<i>Juniperus osteosperma</i>
Utah serviceberry	<i>Amelanchier utahensis</i>
Ute ladies'-tresses orchid	<i>Spiranthes diluvialis</i>
water hemlock	<i>Cicuta maculata</i>
watercress	<i>Rorippa nasturtium aquatica</i>
waterhyme	<i>Hydrilla verticillata</i>
Watson goldenbush	<i>Ericameria watsonii</i>
waxflower	<i>Jamesia tetrapetala</i>
western tansymustard	<i>Descurainia pinnata</i>
white horse-nettle	<i>Solanum elaeagnifolium</i>
White River catseye	<i>Cryptantha welshii</i>
willow	<i>Salix</i> spp.
winterfat	<i>Krascheninnikovia lanata</i>
Wyoming big sagebrush	<i>Artemisia tridentata</i> var. <i>wyomingensis</i>
yellow starthistle	<i>Centaurea solstitialis</i>
yellow toadflax	<i>Linaria vulgaris</i>

#### Mammals

American badger	<i>Taxidea taxus</i>
badger	<i>Taxidea taxus</i>
black-tailed jackrabbit	<i>Lepus californicus</i>
bobcat	<i>Lynx rufus</i>
bushy-tailed woodrat	<i>Neotoms cinerea</i>
coyote	<i>Canis latrans</i>
dark kangaroo mouse	<i>Microdipodops megacephalus</i>
golden-mantled ground squirrel	<i>Spermophilus lateralis</i>
gray fox	<i>Urocyon cinereoargenteus</i>
gray fox	<i>Urocyon cinereoargenteus</i>
ground squirrels	<i>Spermophilus</i> spp.
jackrabbit	<i>Lepus</i> spp.
kangaroo rat	<i>Dipodomys</i> spp.
Kit fox	<i>Vulpes macrotis</i>
least chipmunk	<i>Tamias minimus</i>

TABLE C-1  
Common and Scientific Names

Common Name	Scientific Name
mountain lion	<i>Felis concolor</i>
mule deer	<i>Odocoileus hemionus</i>
Nuttall's cottontail	<i>Sylvilagus nuttallii</i>
Piute (Great Basin) ground squirrel	<i>Spermophilus mollis</i>
Preble's shrew	<i>Sorex preblei</i>
Pronghorn	<i>Antilocapra americana</i>
pygmy rabbit	<i>Brachylagus idahoensis</i>
pygmy shrew	<i>Sorex minutus</i>
Richardson's ground squirrel	<i>Spermophilus elegans nevadensis</i>
rock squirrel	<i>Spermophilus variegates</i>
sagebrush vole	<i>Lagurus curtatus</i>
Townsend's ground squirrel	<i>Spermophilus townsendii</i>
white-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>
<b>Bats</b>	
California myotis	<i>Myotis californicus</i>
fringed myotis	<i>Myotis thysanodes</i>
little brown bat	<i>Myotis lucifugus</i>
pallid bat	<i>Antrozous pallidus</i>
spotted bat	<i>Euderma maculatum</i>
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>
western small-footed myotis	<i>Myotis ciliolabrum</i>
<b>Birds</b>	
American avocet	<i>Recurvirostra americana</i>
American crow	<i>Corvus brachyrhynchos</i>
American kestrel	<i>Falco sparverius</i>
bald eagle	<i>Haliaeetus leucocephalus</i>
black-billed magpie	<i>Pica hudsonia</i>
black-throated gray warbler	<i>Dendroica nigrescens</i>
bobolink	<i>Dolichonyx oryzivorus</i>
Brewer's sparrow	<i>Spizella breweri</i>
Canada goose	<i>Branta canadensis</i>
common nighthawk	<i>Chordeiles minor</i>
common raven	<i>Corvus corax</i>
Cooper's hawk	<i>Accipiter cooperi</i>
eared grebe	<i>Podiceps nigricollis</i>
European starling	<i>Sturnus vulgaris</i>

TABLE C-1  
Common and Scientific Names

Common Name	Scientific Name
ferruginous hawk	<i>Buteo regalis</i>
golden eagle	<i>Aquila chrysaetos</i>
gray vireo	<i>Vireo vicinior</i>
great horned owl	<i>Bubo virginianus</i>
greater sage-grouse	<i>Centrocercus urophasianus</i>
green-tailed towhee	<i>Pipilo chlorurus</i>
green-winged teal	<i>Anas crecca</i>
gulls	<i>Larus spp.</i>
horned lark	<i>Eremophila alpestris</i>
house sparrow	<i>Passer domesticus</i>
juniper titmouse	<i>Baeolophus griseus</i>
kestrels	<i>Falco sparverius</i>
killdeer	<i>Charadrius vociferous</i>
least bittern	<i>Ixobrychus exilis</i>
loggerhead shrike	<i>Lanius ludovicianus</i>
long-billed curlew	<i>Numenius americanus</i>
long-eared owl	<i>Asio otus</i>
mallard	<i>Anas platyrhynchos</i>
mountain bluebird	<i>Sialia currucoides</i>
mountain chickadee	<i>Poecile gambeli</i>
mourning dove	<i>Zenaida macroura</i>
northern flicker	<i>Colaptes auratus</i>
northern goshawk	<i>Accipiter gentiles</i>
northern harrier	<i>Circus cyaneus</i>
northern pintail	<i>Anas acuta</i>
peregrine falcon	<i>Falco peregrinus</i>
pinyon jay	<i>Gymnorhinus cyanocephalus</i>
prairie falcon	<i>Falco mexicanus</i>
red-tailed hawk	<i>Buteo jamaicensis</i>
red-winged blackbird	<i>Agelaius phoeniceus</i>
relict dace	<i>Relictus solitarius</i>
rough-legged hawk	<i>Buteo lagopus</i>
sage sparrow	<i>Amphispiza bellii</i>
sage thrasher	<i>Oreoscoptes montanus</i>
sandhill crane	<i>Grus Canadensis</i>
short-eared owl	<i>Asio flammeus</i>

TABLE C-1  
Common and Scientific Names

Common Name	Scientific Name
spotted towhee	<i>Pipilo maculatus</i>
Swainson's hawk	<i>Buteo swainsoni</i>
tricolored blackbird	<i>Agelaius tricolor</i>
turkey vulture	<i>Cathartes aura</i>
vesper sparrow	<i>Pooecetes gramineus</i>
western bluebird	<i>Sialia mexicana</i>
western meadowlark	<i>Sturnella neglecta</i>
western screech owl	<i>Otus kennicottii</i>
western scrub jay	<i>Aphelocoma californica</i>
western snowy plover	<i>Charadrius alexandrinus</i>
white-faced ibis	<i>Plegadis chihi</i>
Wilson's phalarope	<i>Phalaropus tricolor</i>
yellow warbler	<i>Dendroica petechia</i>
yellow-billed cuckoo	<i>Coccyzus americanus</i>
yellow-breasted chat	<i>Icteria virens</i>
<b>Amphibians</b>	
Columbia spotted frog	<i>Rana luteiventris</i>
Great Basin gopher snake	<i>Pituophis catenifer deserticola</i>
northern leopard frog	<i>Rana pipiens</i>
Pacific tree frog	<i>Pseudacris regilla</i>
spadefoot toad	<i>Scaphiopus hammondi</i>
<b>Reptiles</b>	
Great Basin gopher snake	<i>Pituophis catenifer deserticola</i>
Great Basin rattlesnake	<i>Crotalus viridis lutosus</i>
horned lizard	<i>Phrynosoma platyrhinos</i>
Northern desert horned lizard	<i>Phrynosoma platyrhinos</i>
sagebrush lizard	<i>Sceloporus graciosus</i>
short-horned lizard	<i>Phrynosoma douglassii</i>
western fence lizard	<i>Sceloporus occidentalis</i>
<b>Insects</b>	
Baking Powder Flat blue	<i>Euphilotes bernardino minuta</i>
dark sandhill skipper	<i>Polites sabuleti nigrescens</i>
Koret's checkerspot	<i>Euphydryas editha koreti</i>
Steptoe Valley crescent spot	<i>Phyciodes pascoensis arenacolor</i>
White River wood nymph	<i>Cercyonis pegala pluvialis</i>

TABLE C-1  
Common and Scientific Names

Common Name	Scientific Name
<b>Springsnails</b>	
Northern Steptoe springsnail	<i>Pyrgulopsis serrata</i>
Pulmonates	<i>Physa</i> ssp., <i>Lymnaea</i> ssp., <i>Gyraulus</i> ssp., and <i>Fossaria</i> ssp.
southern Steptoe pyrg	<i>Pyrgulopsis sulcata</i>
springsnail	<i>Pyrgulopsis serrata</i>
<b>Fish</b>	
brook trout	<i>Salvelinus fontinalis</i>
largemouth bass	<i>Micropterus salmoides</i>
northern pike	<i>Esox lucius</i>
rainbow trout	<i>Oncorhynchus mykiss</i>
relict dace	<i>Relictus solitarius</i>
tiger trout	<i>Salmo trutta</i> x <i>Salvelinus fontinalis</i>
Utah chub	<i>Gila atraria</i>

TABLE C-2  
Wildlife Observed or with High Potential to Occur in the WPES Project Area

Scientific Name	Common Name	Observed (Y/N)	Habitat Type in Project Area
<b>Birds</b>			
<i>Lanius ludovicianus</i>	Loggerhead shrike	Y	Sagebrush/Pinyon-Juniper
<i>Eremophila alpestris</i>	Horned lark	Y	Sagebrush
<i>Oreoscoptes montanus</i>	Sage thrasher	Y	Sagebrush
<i>Amphispiza belli</i>	Sage sparrow	Y	Sagebrush
<i>Spizella breweri</i>	Brewer's sparrow	N	Sagebrush
<i>Sialia mexicana</i>	Western bluebird	Y	Sagebrush/Pinyon-Juniper
<i>Sturnella neglecta</i>	Western meadowlark	Y	Sagebrush/Pinyon-Juniper
<i>Corvus corax</i>	Common raven	Y	All
<i>Circus cyaneus</i>	Northern harrier	Y	Sagebrush
<i>Chordeiles minor</i>	Common nighthawk	Y	Sagebrush/Pinyon-Juniper
<i>Charadrius vociferous</i>	Killdeer	Y	Wetlands/Salt Desert Scrub
<i>Sialia currucoides</i>	Mountain bluebird	Y	Pinyon-Juniper
<i>Gymnorhinus cyanocephalus</i>	Pinyon jay	Y	Pinyon-Juniper
<i>Aphelocoma californica</i>	Western scrub jay	Y	Pinyon-Juniper
<i>Poecile gambeli</i>	Mountain chickadee	Y	Pinyon-Juniper

TABLE C-2  
Wildlife Observed or with High Potential to Occur in the WPES Project Area

Scientific Name	Common Name	Observed (Y/N)	Habitat Type in Project Area
<i>Dendroica nigrescens</i>	Black-throated gray warbler	Y	Pinyon-Juniper
<i>Dendroica petechia</i>	Yellow warbler	Y	Pinyon-Juniper near streams
<i>Falco sparverius</i>	American kestrel	Y	Sagebrush/Pinyon-Juniper
<i>Pipilo chlorurus</i>	Green-tailed towhee	N	Sagebrush
<i>Falco mexicanus</i>	Prairie falcon	Y	Sagebrush/Pinyon-Juniper
<i>Falco peregrinus</i>	Peregrine falcon	N	Cliff ledges in Pinyon-Juniper
<i>Accipiter cooperi</i>	Cooper's hawk	N	Pinyon-Juniper woodland and woodland edges
<i>Buteo swainsoni</i>	Swainson's hawk	N	Pinyon-Juniper/isolated trees
<i>Buteo jamaicensis</i>	Red-tailed hawk	Y	All
<i>Pica hudsonia</i>	Black-billed magpie	Y	Sagebrush/Pinyon-Juniper
<i>Buteo lagopus</i>	Rough-legged hawk	N	Agricultural fields, Grasslands
<i>Aquila chrysaetos</i>	Golden eagle	Y	Sagebrush/Pinyon-Juniper
<i>Poocetes gramineus</i>	Vesper sparrow	N	Sagebrush
<i>Pipilio maculates</i>	Spotted towhee	Y	Pinyon-Juniper
<i>Asio otus</i>	Long-eared owl	N	Woodlands
<i>Asio flammeus</i>	Short-eared owl	N	Grasslands, Sand Dunes, Marshes
<i>Otus kennicottii</i>	Western screech owl	N	Forest edges, Tree cavities
<i>Bubo virginianus</i>	Great horned owl	N	Pinyon-Juniper woodlands
<i>Cathartes aura</i>	Turkey vulture	Y	All
<i>Corvus brachyrhynchos</i>	American crow	Y	All
<i>Agelaius phoeniceus</i>	Red-winged blackbird	Y	Wetland
<i>Numenius americanus</i>	Long-billed curlew	Y	Wetland/Duck Creek
<i>Recurvirostra americana</i>	American avocet	Y	Wetland/Duck Creek
<i>Anas acuta</i>	Northern pintail	Y	Wetland/Duck Creek
<i>Grus canadensis</i>	Sandhill crane	Y	Wetland/Duck Creek
<i>Branta canadensis</i>	Canada goose	N	Wetlands/Aquatic Habitats, Agricultural
<i>Anas platyrhynchos</i>	Mallard	N	Wetlands/Shallow Aquatic Habitats
<i>Anas crecca</i>	Green-winged teal	N	Aquatic Habitats/Winter Resident
<i>Centrocercus urophasianus</i>	Greater sage-grouse	Y	Sagebrush
<i>Colaptes auratus</i>	Northern flicker	Y	Pinyon-Juniper

TABLE C-2

Wildlife Observed or with High Potential to Occur in the WPES Project Area

Scientific Name	Common Name	Observed (Y/N)	Habitat Type in Project Area
<b>Mammals</b>			
<i>Canis latrans</i>	Coyote	Y	All
<i>Vulpes macrotis</i>	Kit fox	N	Sagebrush
<i>Urocyon cinereoargenteus</i>	Common gray fox	Y	Rocky, mountain forests
<i>Odocoileus hemionus</i>	Mule deer	Y	Sagebrush
<i>Antilocarpa americana</i>	Pronghorn	Y	Sagebrush
<i>Lepus californicus</i>	Black-tailed jackrabbit	Y	All
<i>Sylvilagus nutallii</i>	Mountain cottontail	Y	Sagebrush/Pinyon-Juniper
<i>Brachylagus idahoensis</i>	Pygmy rabbit	Y	Sagebrush
<i>Spermophilus elegans nevadensis</i>	Richardson's ground squirrel	N	Rocky habitats in Pinyon-Juniper/Sagebrush
<i>Amnospermophilus leucurus</i>	White-tailed antelope squirrel	N	Sagebrush
<i>Spermophilus lateralis</i>	Golden-mantled ground squirrel	N	Sagebrush
<i>Spermophilus townsendii</i>	Townsend's ground squirrel	N	Sagebrush
<i>Spermophilus variegates</i>	Rock squirrel	N	Rocky habitats in Pinyon-Juniper
<i>Spermophilus mollis</i>	Piute (Great Basin) ground squirrel	N	Sagebrush
<i>Tamias minimus</i>	Least chipmunk	N	Rocky habitats in Pinyon-Juniper
<i>Taxidea taxus</i>	American badger	N	Sagebrush
<i>Sorex minutus</i>	Pygmy shrew	N	Sagebrush
<i>Felis concolor</i>	Mountain lion	N	Pinyon-Juniper
<i>Antrozous pallidus</i>	Pallid bat	N	Rocky cliffs, Low scrub
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	N	Caves and mines
<i>Euderma maculatum</i>	Spotted bat	N	Caves, rock crevices
<i>Myotis californicus</i>	California myotis	N	Coniferous forest, cliffs, caves
<i>Myotis ciliolabrum</i>	Western small-footed myotis	N	Rocky cliffs, forested, grassland
<i>Myotis lucifugus</i>	Little brown myotis	N	Coniferous forest , riparian
<b>Amphibians</b>			
<i>Rana pipiens</i>	Northern leopard frog	Y	Aquatic
<b>Fish</b>			
<i>Relictus solitarius</i>	Relict dace	Y	Aquatic

TABLE C-2  
Wildlife Observed or with High Potential to Occur in the WPES Project Area

Scientific Name	Common Name	Observed (Y/N)	Habitat Type in Project Area
<b>Reptiles</b>			
<i>Pituophis catenifer deserticola</i>	Great Basin gopher snake	Y	Wetland
<i>Sceloporus graciosus</i>	Sagebrush lizard	Y	Sagebrush
<i>Sceloporus occidentalis</i>	Western fence lizard	Y	Sagebrush/Pinyon-Juniper
<i>Phrynosoma platyrhinos</i>	Northern desert horned lizard	Y	Sagebrush
<i>Crotalus viridis lotus</i>	Western/Great Basin rattlesnake	Y	Sagebrush

## Background Information on Flora and Fauna and on Threatened, Endangered, Candidate, and Sensitive Species

### Federally Protected Species

#### Bald Eagle

In the western United States, bald eagles nest near waterways that provide abundant food sources and build their nests in large trees. However, historical records indicate bald eagles utilized cliffs for nesting near Pyramid Lake, Nevada (Linsdale, 1936 as cited in FWS, 1986) and in 1985, a pair nested on a cliff on an island at Pyramid Lake, Nevada (FWS, 1986). They usually nest the same territories each year and often use the same nests repeatedly. Their home range is between 1,700 and 10,000 acres, depending on food availability.

Bald eagles prey on a wide variety of fish, waterfowl, small mammals, and carrion (Stalmaster, 1986). In portions of the western United States, eagles forage on warm-water and non-game fish, waterfowl, and small mammals (FWS, 1986). Areas that provide open water, wetlands, shrub steppe, and other foraging habitats near forests or single large trees are particularly important for bald eagles. Because of the lack of water, wintering eagles in Nevada occur as small groups near isolated water bodies and often prey on jackrabbits (*Lepus* spp.) (FWS, 1986). During winter, bald eagles use perches that are near food sources. Bald eagles commonly perch on artificial structures such as powerline poles and towers. Night roosts used during winter typically provide eagles with protection from the weather. Wintering eagles sometimes roost in permanent communal night roosts, with multiple birds per tree, although eagles also roost individually.

#### Yellow-Billed Cuckoo

The yellow-billed cuckoo is relatively common east of the Rocky Mountains, but habitat degradation and loss of riparian habitat in the West has led to the cuckoo's candidate status. The yellow-billed cuckoo's historic breeding range extended through most of North America from southern Canada to Mexico. The recent range of yellow-billed cuckoos includes populations in Arizona, New Mexico, and California (66 FR 38611). Historically, yellow-

billed cuckoos were found along the lower Truckee River, Lahontan Valley (Oakleaf, 1974), and along the Colorado River in southern Nevada (Neel, 1999). The most recent documentation of the yellow-billed cuckoo nesting in Nevada was a pair observed in Lincoln County in 1979. Since 1990, there have been only sporadic sightings of single birds in Nevada (Neel, 1999). Surveys conducted in 2000 by NDOW (2001, as cited in 66 FR 38611) in southern Nevada documented 19 yellow-billed cuckoo (4 pairs and 11 unpaired birds) with no nests being found. NDOW estimated the summer population of yellow-billed cuckoo is between 20 and 30 birds statewide.

The yellow-billed cuckoo is a riparian obligate species that requires dense cottonwood-willow forested tracts of at least 16.8 hectares, including a minimum of 3.0 hectares of closed-canopy broadleaf forest (Laymon and Halterman, 1987). A wide band of cottonwood canopy closure is required, as is a healthy midstory of willow (Gaines and Laymon, 1984; Laymon and Halterman, 1987; Franzreb and Laymon, 1993; Hughes, 1999). In addition, cuckoos appear to prefer dense understory foliage as an important habitat component.

## **State Protected Species**

### **Townsend's Big-Eared Bat**

Townsend's big-eared bat is found throughout western North America from British Columbia south to the Isthmus of Tehuantepec, eastward to the Black Hills of South Dakota, across western Texas, and eastward to the Edwards Plateau. Isolated populations exist in the gypsum caves of northeastern Texas, Oklahoma, and Kansas, and in limestone regions of Arkansas, Missouri, Illinois, Indiana, Ohio, Kentucky, Virginia, and West Virginia (NatureServe, 2006). This species is found primarily in abandoned mines and caves, but is rarely found in crevices. This species is usually associated with forested community types and riparian areas. Townsend's big-eared bats migrate in the winter and reproduce in late spring to early summer. Like most bats, this species is an insectivore and will eat moths and caddisflies. Townsend's big-eared bat tends to hibernate singly, but can occur in clusters during winter in some areas (Schmidly, 1991).

### **Pallid Bat**

The pallid bat is found in Western North America from south-central British Columbia (Okanagan Valley; low numbers) south through the western U.S. to southern Baja California, central Mexico, southern Kansas, southern Texas; and Cuba (NatureServe, 2006). The pallid bat often roosts in colonies of between 20 and several hundred individuals. Summer maternity colonies are found within warm rock crevices, abandoned mines, caves, hollow trees, and in cavern-like building features (for example, attics). This species has also been documented roosting in large conifer snags (Texas State Parks, 2006). This species breeds between October and February. Young are generally born between May and July depending on local climatic variables. Female pallid bats can give birth to a single pup, twins, and sometimes triplets, with twins being most common. Maternity colonies disband between August and October (Texas State Parks, 2006). This species remains relatively inactive during the winter, but is not known to migrate. Pallid bats are believed to hibernate as solitary individuals or in small numbers. Occasional winter activity has been reported in southern portions of its range. Pallid bats are primarily insectivorous, and feed from the ground and occasionally when in flight (Texas State Parks, 2006).

## Spotted Bat

The spotted bat is a former Candidate species and is currently a state protected species as well as a BLM sensitive species. The spotted bat's range is from eastern Washington, Oregon, and California, east to Idaho, Montana, Arizona, Utah, western Colorado, and Texas, and though New Mexico and Utah (NatureServe, 2006). This species is primarily solitary, but has been known to roost in small groups. The spotted bat's roost sites are consistently associated with caves, and in cracks and crevices in cliffs and canyons (NatureServe, 2006). This species is found in a variety of habitats including desert to montane coniferous stands of open ponderosa pine, pinyon-juniper woodland, canyon bottoms; open pasture and hayfields; and herbaceous wetlands and riparian areas (NatureServe, 2006). Young are believed to be born in mid-to-late June depending on the local climate. This species feeds primarily on nocturnal beetles and moths. The pallid bat occupies coniferous stands in summer and migrates to lower elevations in late summer/early fall (NatureServe, 2006).

## Western Small-Footed Myotis

The western small-footed myotis occurs throughout western North America from southern Saskatchewan, southern Alberta, and southern British Columbia south through the western United States (not including coastal areas north of southern California) into central Mexico (NatureServe, 2006). This species inhabits desert, badland, and semiarid habitats, and more mesic habitats in the southern part of its range (NatureServe, 2006). This myotis prefers to forage on small insects over rocks instead of water. During the summer it roosts in rock crevices, caves, tunnels, under boulders, beneath loose bark, or in buildings. Maternity colonies are often found in barns and buildings (NatureServe, 2006). The western small-footed myotis hibernates in caves and mines. Young are born late May through July.

## Little Brown Myotis

The little brown myotis is widespread in North America from Alaska-Canada boreal forests south through most of the contiguous U.S. This species is generally missing from the southern Great Plains region (NatureServe, 2006). The southwestern populations formerly assigned to this species have now been assigned to *M. occultus* (Piaggio et al., 2002; Simmons, in Wilson and Reeder in prep.). As a result, the southwestern boundary of its range includes southern California (except extreme southeast), Nevada, northern Utah, northern Colorado, and perhaps northeastern New Mexico (Piaggio et al. 2002; NatureServe, 2006). The little brown myotis gives birth to one young in late spring to early summer. Winter concentrations may include tens of thousands. Little information is available for summer range. Studies have shown that this species has adapted to using human-made structures for resting and maternity sites; it also uses caves and hollow trees (NatureServe, 2006). The little brown myotis generally forages on flying insects in woodlands near water (NatureServe 2006). During winter, this species requires a relatively constant temperature of about 40 degrees F and 80 percent relative humidity. They will use caves, tunnels, abandoned mines, and similar sites. Maternity colonies are commonly found in warm sites in buildings and other structures, and occasionally this species will use hollow trees.

## California Myotis

The Californian myotis occurs in western North America, from extreme southern Alaska south through British Columbia and the western U.S. to southern Baja California and

Guatemala (Wilson and Reeder, 1993). In the U.S., this species is found throughout the desert Southwest, and in lowlands to Montana, Utah, and Colorado. The full extent of the California myotis winter range is unknown, though it has been found in California, Nevada, Utah, Arizona, and Texas (Barbour and Davis, 1969). This species is found at elevations up to 6,000 feet. Females give birth to a single young between late May and mid-June. This species forages on insects from the air over forested and riparian/wetland areas. It is known to hibernate, but active bats regularly have been caught in Nevada in fall and winter, frequently in temperatures below 43 degrees F.

### **Ferruginous Hawk**

The ferruginous hawk is known to breed in eastern Oregon and Washington, southern Alberta, southern Saskatchewan, extreme southwest Manitoba, northern Nevada, Utah, Wyoming, Montana, North Dakota, South Dakota, Nebraska, New Mexico, Arizona, and Colorado. This species is a non-breeding resident primarily in the southwestern and south-central U.S., south to Baja California and in the central mainland of Mexico. Non-breeding species have the greatest numbers in western Texas, eastern New Mexico, and western Oklahoma (Root, 1988; NatureServe, 2006).

The ferruginous hawk inhabits grasslands and sagebrush habitats in western North America. Within the BLM Ely District, the greatest percentages of ferruginous hawk nest sites are within juniper stringers on big sagebrush or black sagebrush knolls and within 2 miles of white sage (Perkins 1982). Mature ferruginous hawks arrive on their breeding grounds late February-early March. This species can be found within their breeding habitat from late February through early October.

Ferruginous hawk density and productivity are closely associated with cycles in prey abundance (Woffinden, 1975; NatureServe, 2006). During the breeding season, this species primarily feeds upon mammals, but they are also known to prey upon other birds, amphibians, reptiles, and insects (NatureServe 2006). Habitat suitability also takes into account the vulnerability of prey species. Ferruginous hawks avoid dense vegetation that reduces their ability to see prey.

### **Greater Sage-grouse**

The greater sage-grouse is a ground dwelling bird that can grow up to 2 feet in height and 30 inches in length (FWS, 2004). This species can be found in elevations ranging from 4,000 to over 9,000 feet.

The greater sage-grouse is a species of concern in Nevada because of a decline in suitable habitat, which has resulted from unsuitable land uses and management of sagebrush ecosystems. Overgrazing, increased land clearing for agricultural purposes, and invasion of non-native species have negatively impacted sagebrush ecosystems and have made these communities more susceptible to severe wildfire outbreaks (Paige and Ritter, 1999).

In Nevada, some livestock management practices have altered sage-grouse habitat over the past 100 years. Livestock facilities such as spring developments, water pipelines, and fencing can lead to distribution of livestock into areas previously undisturbed, contributing to long-term changes in plant communities that can reduce the overall health of sagebrush habitats (BLM, 2000). Severe wildfire and the spread of invasive and noxious weeds also

significantly alter sagebrush ecosystems to the detriment of the greater sage-grouse. Power lines, fences, roads, and urban development have an adverse impact on greater sage-grouse populations (Braun 1998). These types of structures provide perches for raptor species to prey on sage-grouse and can also lead to sage-grouse mortality as a result of collision with guy wires (BLM, 2000). Another threat to sage-grouse in Nevada is the expansion of the pinyon-juniper community type in the Great Basin. Encroachment of pinyon-juniper into sagebrush shrubland may lead to a decline in habitat for sage-grouse (BLM, 2000).

The sage-grouse breeding season extends from mid- March to mid-June. Male sage-grouse gather to perform courtship displays in areas known as leks. Leks are defined as “a traditional display ground where two or more male sage-grouse have attended in two or more of the previous five years” (Connelly et al., 2003). Leks are usually open areas in sagebrush communities that are surrounded by denser sagebrush cover. Lek sites are the same areas generally used from year to year, assuming new disturbance (natural or man-made) has not forced the grouse to abandon the area.

Studies have shown that large expanses of habitat are needed to allow for connectivity between various residential populations of sage-grouse. The majority of sage-grouse nests are located under sagebrush plants (Connelly et al., 2004) . On average, the most nests are located within 4 miles of the lek, but can be up to 12 miles away from the lek (NDOW, 2004a). Sage-grouse nesting habitat consists primarily of big sagebrush communities that have 15-38 percent canopy cover with a grass and forb understory (Connelly et al., 1991, Gregg et al., 1994, Sveum et al., 1998). Brood rearing habitats are used from April through August. Hens will move their broods to moister sites with more succulent vegetation (black sagebrush and low sagebrush) June through July.

In the winter months, the greater sage-grouse diet consists primarily of sagebrush leaves and buds. The taller Wyoming sagebrush is preferred for foraging this time of year. The sagebrush must be at least 10 to 12 inches above snow level to provide both foraging and cover requirements. When snow accumulation is above average, grouse will move down and feed on sagebrush species present at lower elevations (Patterson, 1952, as cited in Connelly et al., 2004).

### **Pygmy Rabbit**

Pygmy rabbits are found in eastern Washington, Oregon, northeastern California, Idaho, Montana, Nevada, western Utah, and southwest Wyoming. Pygmy rabbits inhabit shrublands, typically in dense stands of old growth sagebrush. This species digs its own burrows in deep, loose soils. Distribution of this species is patchy in the Great Basin (NDOW, 2005a).

Pygmy rabbits are active year round and are primarily seen at dusk and dawn. Pygmy rabbits primarily forage on big sagebrush, but will also forage on grasses and forbs in mid-to-late summer (NatureServe, 2006; Green and Flinders, 1980; Lyman, 1991). This species breeds spring to early summer. Threats to this species include habitat loss, predation, introduced diseases, and low population sizes. Protection of well-developed sagebrush is the most effective and practical means of managing and conserving pygmy rabbit habitat.

# Risk Assessment for Noxious/Invasive Weeds

Oden, Eric/BOI

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**From:** Diana Leiker [Diana.Leiker@edaw.com]  
**Sent:** Wednesday, February 28, 2007 8:41 AM  
**To:** Oden, Eric/BOI  
**Subject:** Re: Fwd: White Pine Energy Project-Noxious Weed Risk Assessment  
**Attachments:** Risk Assessment for Noxious FINAL 070205.doc



Risk Assessment for  
Noxious Fl...

>>> <Bonnie\_Waggoner@nv.blm.gov> 2/5/2007 3:39 PM >>>  
Hi Diana -

The Weed Risk Assessment for the White Pine Energy Station EIS is complete and ready to go!

Thanks again!

Bonnie M. Waggoner  
Noxious & Invasive Weed Coordinator  
Bureau of Land Management - Ely District HC 33 Box 33500 Ely, NV 89301  
office: 775-289-1827  
cell: 703-244-1705  
fax: 775-289-1910

\*Diana Leiker\* <Diana.Leiker@edaw.com>  
02/05/2007 02:09 PM

To  
<Bonnie\_Waggoner@nv.blm.gov>  
cc

Subject  
Re: Fwd: White Pine Energy Project-Noxious Weed Risk Assessment

Hi Bonnie,  
Your edits have been incorporated into the risk assessment. If you could send me a confirmation email that the risk assessment is complete that would be great. I will send the appropriate BMPs onto the editors for inclusion in the DEIS.

Thanks!

Diana

Diana Leiker  
Natural Resource Specialist  
EDAW, Inc  
1809 Blake St., Suite 200  
Denver, CO 80202  
303-308-3556

# Risk Assessment for Noxious/Invasive Weeds

**Project Name:** White Pine Energy Project

Directions: This document is intended for electronic use. Adjust the spacing as necessary. Retain one copy of this document with your project files. Provide the Weed Coordinator with a second copy of the form and a project map.

**Date Risk Assessment was completed:** May 31-June 12, 2004

**Steps taken to complete Risk Assessment:** EDAW conducted field reconnaissance for biological resources of concern in the White Pine Energy Station (WPES) project area in June 2004 to collect data necessary for completing a National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS) for the proposed action and an alternative action. EDAW used the protocol provided by the Bureau of Land Management (BLM) through the Tri-County Weed Program for all project facilities with the exception of the portion of the proposed transmission line that spans the Egan Range. The protocol involved field teams traveling along the centerline of the proposed corridors for the water pipeline, railroad track spurs, and the transmission power line rights-of-way (ROWs). Both noxious and invasive species were included during data collection for the risk assessment.

At every 0.25 mile, the field teams recorded the approximate density (ocular estimate) of each invasive species present according to the following schedule:

No weed present	0 plants/m <sup>2</sup>
Light infestation	1–5 plants/m <sup>2</sup>
Moderate infestation	6–25 plants/m <sup>2</sup>
Heavy infestation	25–50 plants/m <sup>2</sup>
Very heavy infestation	51+ plants/m <sup>2</sup>

At each mile point, there was a count of invasive weed species using one square meter (9.6 square feet) quadrat frames. Quadrats were not used for the transmission ROW, because the alignment of the transmission line was not defined at the time surveys were completed. In the Egan Range portion of the SWIP (Southwest Intertie Project) alignment, EDAW selected random points within 0.5-mile-wide SWIP corridor and recorded weed densities accordingly.

If the centerline of a proposed corridor followed a previously existing linear disturbance (such as a road or trail), then one quadrat was placed immediately adjacent to the edge of the disturbance and the second quadrat was placed just outside the roadside/trail infestation on the same side as the first quadrat.

Complete noxious weed mapping will occur prior to construction.

**Project Description:** The White Pine Energy Project is a coal-fired generation facility to be located on BLM-administered land in Steptoe Valley. Project components with potential impacts to vegetation resources include the power plant ROW, electric transmission facilities ROW, water supply system ROW, rail spur ROW, substation ROW, access ROW, and additional construction ROW (including minerals materials sale), and Moriah Ranches Seeding Project). Table 1-1 summarizes project features and approximate long-term and short-term impacts resulting from each feature.

TABLE C-3  
Estimated Acres of ROWs and Disturbed and Reclaimed Areas for the Proposed Action

	ROWs		Disturbed and Reclaimed Areas		
	Temporary (acres) <sup>a</sup>	Permanent (acres) <sup>b</sup>	Short- Term <sup>a</sup> (acres)	Reclaimed (acres)	Long- Term <sup>c</sup> (acres)
<b>Power Plant ROW</b>	0	1,281	1,281	0	1,281
<b>Electric Transmission Facilities ROW</b>					
Duck Creek Substation ROW	0	60	60	0	60
Thirtymile Substation ROW	0	77	77	0	77
Duck Creek to Thirtymile 500-kV Line ROW	0	774	249	199	50
Falcon-Gonder 345-kV Interconnection ROW	0	9	8	7	1
SWIP 500 kV Interconnection ROW	0	122	40	34	6
<b>Water Supply System ROW</b>					
Linear Facilities ROW (30-foot wide temporary)	48	0	48	48	0
Linear Facilities ROW (40-foot wide permanent)	0	64	64	48	16
Ground Water Well ROW (8 wells)	0	4	4	3	1
Construction Staging Area ROW	2	0	2	2	0
<b>Rail Spur ROW</b>					
Temporary ROW (30-foot wide)	5	0	5	5	0
Permanent ROW (35- to 70-foot wide)	0	9	9	0	9
<b>Access ROW</b>					
Power Plant ROW Access	0	6	6	0	6
Duck Creek Substation ROW Access	0	1	1	0	1
Thirtymile Substation ROW Access	0	2	2	0	2
<b>Additional Construction ROW</b>					
Electric Distribution Line	6	0	6	6	0
Off-Site Borrow Area	40	0	40	40	0
<b>Total</b>	<b>101</b>	<b>2,409</b>	<b>1,902</b>	<b>392</b>	<b>1,510</b>

<sup>a</sup> Construction

<sup>b</sup> Construction plus life of Station

<sup>c</sup> Operations

## Project Location (See DEIS Figure 1-1)

*If the proposed action will require regular traffic between the site of the proposed action and another site such as a gravel pit or mill, please consider the other site to be part of the project area.*

The proposed WPES would be located within the Egan Resource Management Plan (RMP) area. The Egan RMP (BLM, 1984b) identifies several thousand acres of public land for disposal in Steptoe Valley, north of Ely, including land in the area of the proposed Station. Land disposal of the power plant ROW is consistent with the Egan RMP.

The power plant ROW would be located entirely in White Pine County, Nevada, approximately 26 miles south of the White Pine County/Elko County line and approximately 40 miles west of the Nevada/Utah border. Prominent landmarks in the area of the power plant ROW include U.S. Highway 93 (U.S. 93) and the Schell Creek Range (in the Humboldt National Forest) to the east; Duck Creek and the Egan Range to the west; and Goshute Lake to the north. The communities of McGill and Ely are approximately 22 miles and 34 miles south of the power plant ROW, respectively, and Great Basin National Park is 60 miles to the southeast.

The proposed and alternative actions would include a water supply system, temporary distribution lines, a rail spur (approximately 11,000 linear feet of track). The proposed water supply system would extend 13 miles north from the proposed power plant ROW. The alternative water supply system would extend 8 miles south from the alternative power plant ROW. An approximately 2-acre ROW would be temporarily be used for the staging area for placement of materials and equipment during construction. An access road would be located along the water pipeline and electrical distribution line for maintenance purposes and to provide access to each well site. Roads would typically be 10 feet wide.

The electrical transmission facilities for the project would consist of overhead 500-kV (3) and 345-kV (2) electric transmission lines and two electric substations. The first 500-kV line would require a 200-foot ROW and would be approximately 32 miles long, running from Duck Creek to Thirtymile Substation. The project includes two approximately 2.5 mile long, 200 foot wide, 500-kV transmission lines to interconnect the planned SWIP 500-kV transmission lines to the Duck Creek Substation. Two 0.2 mile long, 345-kV lines with 160-foot ROWs would interconnect the Falcon-Gonder 345-kV transmission line to Thirtymile Substation.

The Duck Creek Substation would be located adjacent to and immediately south of the power plant ROW. The Thirtymile Substation would be located in Section 19, Township 18 North, Range 61 East.

A 1.3-mile long rail spur would be constructed from the existing Nevada Northern Railway (NNR) to a rail loop that would be constructed on the proposed power plant ROW. A single span or simple 3-span trestle bridge would be used to cross Duck Creek. These bridge types were chosen to minimize impacts to wetland communities and maintain surface flows in Duck Creek. The alternative rail spur would be 3 miles long and also be constructed from the existing NNR to a rail loop that would be constructed on the alternative power plant ROW.

One or more borrow areas, via minerals materials sale, would be established to provide earth and rock materials during site preparation and throughout the construction process for concrete and asphalt mixes, road base, lining of dikes, and rock surfaced areas. A temporary ROW for the off-site borrow areas would cover approximately 40 acres within the area identified in Figure 1. A fence, berm, or signs would be established at the borrow area entry to prevent public access. Upon completion of construction the borrow area(s) would be recontoured and reclaimed in accordance with BLM regulations. The borrow pit will be deemed free of noxious weeds by a qualified specialist before it is used.

The Moriah Ranches Seeding Project is a habitat enhancement project that would restore existing pasture to better ecological condition and increase forage for livestock and wildlife. The project would be designed to create a habitat mosaic that provides cover for sage-grouse and antelope. The project would be located 16 miles north of McGill and immediately west of U.S. 93.

Neither the minerals material sale area, staging areas, access roads outside of project feature ROWs, or the Moriah Ranches Seeding area were surveyed for noxious weeds because the location of these areas was not defined at the time field surveys were completed. These areas would be included in pre-construction noxious/invasive weed surveys. The following sections discuss the ratings for Factor 1 and Factor 2 of the Risk Assessment. A summary of field data is included as Tables 2 and 3.

#### Factor 1

A definition of Factor 1 appears in the Attachment below. Factor 1 assesses the likelihood of noxious/invasive weed species spreading to the project area. For this project, the factor rates as **(list rating and score)** at the present time: **Moderate (7)**. This rating was based on the following findings:

Due to the large extent and nature of the project, the White Pine Energy Project has a moderate (7) likelihood of spreading noxious/invasive species throughout the project area, despite the proposed implementation of an integrated weed management plan. This finding is based on the field observations recorded for each project feature in June of 2005. There were two noxious weed species present within the project ROWs. There were additional noxious weed species such as Canada thistle (*Cirsium arvense*) and Scotch thistle (*Onoropodum acanthium*) observed outside of the project ROWs, primarily in Butte Valley along existing access roads. In addition species such as tall whitetop (*Lepidium latifolium*), musk thistle (*Carduus nutans*), Russian knapweed (*Acroptilon repens*), and spotted knapweed (*Centaurea maculosa*) are known to occur within the general area and may be present along travel routes. Travel to and from the ROWs may increase the spread of noxious weeds without proper mitigation.

The majority of weed infestations observed within the proposed and alternative alignments were concentrated along existing access roads, areas previously burned, overgrazed sections, and disturbed areas such as borrow pits. Therefore, the final integrated weed management plan would need to address mitigation measures and best management practices to minimize spread of noxious/invasive weeds in these travel corridors. Given the extent of weed infestations in some areas, it is likely that despite mitigation, invasive weeds may spread in the project area.

The water pipeline for both the proposed and alternative actions would need to be monitored closely post construction to ensure the re-seeding effort is successful to minimize the risk of spreading noxious/invasive species that exist within or adjacent to the ROW.

For the proposed action, risk of spread is moderate to high within the ROWs for the water pipeline, transmission corridors, and power plant.

For the alternative action the risk of spread of noxious/invasive species is moderate to high throughout all project features.

## Factor 2

A definition of Factor 2 appears in Appendix A. Factor 2 assesses the consequences of noxious/invasive weed establishment in the project area. For this project, the factor rates as **(List rating and score)**. This rating was based on the following findings:

A definition of Factor 2 appears in Appendix A. Factor 2 assesses the consequences of noxious/invasive weed establishment in the project area. For this project, the factor rates as **(list rating and score): Moderate (7)**. This rating was based on the following findings:

This rating is based on the current conditions (Tables 2 and 3) within the proposed and alternative project areas and the impacts (total acreage) that would result from construction and operation of the project on the vegetation communities. An increase in the spread of noxious and invasive species as a result of future projects occurring in Steptoe and Butte Valleys would increase the potential for cumulative effects to native plant communities.

## Risk Rating:

The Risk Rating is obtained by multiplying Factor 1 by Factor 2. For this project, the Risk Rating is **(score and rating): Moderate (49)**

**It is important to note that field surveys were conducted in June of 2005. It is probable that weed densities have changed since this time. As a result this risk assessment can only address conditions as they were in 2005. Pre-construction surveys will capture more accurate and detailed information on noxious/invasive weed occurrence in the project area.**

Based on this risk rating, preventative management measures **are** needed for this project. Preventative management measures developed for this project are as follows:

- I. Pre-construction surveys for noxious and invasive species would be conducted by qualified specialists. Weed populations will be mapped during surveys using GIS.
- II. White Pine Energy Associates (WPEA) would be responsible for monitoring and treating identified weed populations within the designated ROWs for the lifetime of the project. Forms of noxious weed treatment would need to be approved by the BLM's Noxious Weed Coordinator. Herbicide treatments within the project ROWs would be reported to the BLM.
- III. WPEA would be responsible for ensuring construction crews clean their vehicles prior to entering and upon leaving construction areas.

- IV. Areas where re-seeding would occur would be monitored for up to 5 years to ensure native plants, which have been disturbed during project construction, return to areas of the ROW.
- V. Materials (gravel, dirt, seeds, etc.) brought into the project area must originate from a weed free source.

The final EIS will include an integrated pest management plan along with a detailed re-seeding plan which will include treatment and monitoring of noxious/invasive species. A list of Reclamation Best Management Practices is included in the DEIS.

Based on this risk rating, project modifications are/**are not (circle one)** needed for this project. Project modifications developed for this project are as follows.

Weed Risk Assessment completed by: Diana Leiker, EDAW/AECOM

Reviewed by/Date Reviewed: \_\_\_\_\_  
Noxious Weed Coordinator Date

## **Attachment:**

### **Factor 1**

**NONE (0):**Noxious/invasive weed species not located within or adjacent to the project area. Project activity is not likely to result in the establishment of noxious/invasive weed species in the project area.

**LOW (1-3):** Noxious/invasive weed species present in areas adjacent to but not within the project area. Project activities can be implemented and prevent the spread of noxious/invasive weeds into the project area.

**MODERATE (4-7):**Noxious/invasive weed species located immediately adjacent to or within the project area. Project activities are likely to result in some areas becoming infested with noxious weed species even when preventative management actions are followed. Control measures are essential to prevent the spread of noxious/invasive weeds within the project area.

**HIGH (7-10):** Heavy infestations of noxious/invasive weeds are located within or immediately adjacent to the project area. Project activities, even with preventative management actions, are likely to result in the establishment and spread of noxious/invasive weeds on disturbed sites throughout much of the project area.

### **Factor 2**

**Low to Nonexistent (1-3):** None. No cumulative effects expected.

**MODERATE(4-7) :** Possible adverse effects on site and possible expansion of infestation within the project area. Cumulative effects on native plant communities are likely, but limited.

**HIGH(7-10) :**Obvious adverse effects within the project area and probable expansion of noxious weed infestations to areas outside the project area. Adverse cumulative effects on native plant communities are probable.

### **Risk Rating**

**NONE (0):** Proceed as planned.

**LOW (1-10):** Proceed as planned. Initiate control treatment on noxious weed populations that get established in the area.

**MODERATE (11-49):** Develop preventative management measures for proposed project to reduce the risk of introduction or spread of noxious weeds into the area. Preventative management measures should include modifying the project to include seeding the area to occupy disturbed sites with desirable species. Monitor area for at least 3 consecutive years and provide for control of newly established populations of noxious weeds and follow-up treatment for previously treated infestations.

**HIGH (50-100):** Project must be modified to reduce risk level through preventative management measures, including seeding with desirable species to occupy disturbed sites and controlling existing infestations of noxious weeds prior to project activity. Project

must provide at least 5 consecutive years of monitoring. Projects must also provide for control of newly established populations of noxious weeds and follow-up treatment for previously treated infestations.

TABLE C-4  
Weed Densities for the Proposed Action

Species	Common Name	Noxious or Invasive	Transmission Lines	Water Supply System	Rail Spur	Power Plant Site
<i>Cardaria draba</i>	Hoary Cress	Noxious	—	—	-	-
<i>Bromus tectorum</i>	Cheatgrass	Invasive	Moderate	High	Low to Moderate	High
<i>Descurainia sophia</i>	Flixweed	Invasive	Moderate	Moderate	Low	Moderate
<i>Sisymbrium altissimum</i>	Tumble mustard	Invasive	—	Moderate to High	—	—
<i>Salsola iberica</i>	Russian thistle	Invasive	Moderate to High	High	—	—
<i>Halogeton glomeratus</i>	Halogeton	Invasive	High	Low to Moderate	Moderate	—
<i>Lepidium perfoliatum</i>	Pepperweed	Invasive	Low	—	—	—
<i>Ranunculus testiculatus</i>	Bur buttercup	Invasive	Moderate to High	—	—	—
<i>Convolvulus arvensis</i>	Field bindweed	Invasive	—	—	—	—
<i>Kochia scoparia</i>	American kochia	Invasive	—	—	Low to Moderate	—
<i>Potentilla recta</i>	Sulphur cinquefoil	Noxious	Low	—	—	—
<i>Taraxacum officinale</i>	Common dandelion	Invasive	Low to Moderate	—	—	—
<i>Lactuca serriola</i>	Prickly lettuce	Invasive	—	Low	—	—

TABLE C-5  
Weed Densities for the Alternative Action

Species	Common Name	Noxious or Invasive	Transmission Lines	Water Supply System	Rail Spur	Power Plant Site
<i>Cardaria draba</i>	Hoary Cress	Noxious	—	—	Moderate	High
<i>Bromus tectorum</i>	Cheatgrass	Invasive	Moderate	Low to Moderate	High	High
<i>Descurainia sophia</i>	Flixweed	Invasive	Moderate	High	—	High
<i>Sisymbrium altissimum</i>	Tumble mustard	Invasive	—	Low to Moderate	—	—
<i>Salsola iberica</i>	Russian thistle	Invasive	Moderate to High	Moderate	—	—
<i>Halogeton glomeratus</i>	Halogeton	Invasive	High	Low to Moderate	—	—
<i>Lepidium perfoliatum</i>	Pepperweed	Invasive	Low	—	—	—
<i>Ranunculus testiculatus</i>	Bur buttercup	Invasive	Moderate to High	—	—	—
<i>Convolvulus arvensis</i>	Field bindweed	Invasive	—	—	—	—
<i>Kochia scoparia</i>	American kochia	Invasive	—	—	—	—
<i>Potentilla recta</i>	Sulphur cinquefoil	Noxious	Low	—	—	—
<i>Taraxacum officinale</i>	Common dandelion	Invasive	Low to Moderate	—	—	—
<i>Lactuca serriola</i>	Prickly lettuce	Invasive	—	—	—	—

**Appendix D**  
**U.S. Fish and Wildlife Service Correspondence**



# United States Department of the Interior

## BUREAU OF LAND MANAGEMENT

Ely Field Office  
HC 33 Box 33500 (702 No. Industrial Way)  
Ely, NV 89301-9408  
<http://www.nv.blm.gov/Ely>

DM 6-17-04

In reply refer to:  
2850 (NV-043)

JUN 18 2004

### Memorandum

To: Field Supervisor, Reno Fish and Wildlife Office, Reno, Nevada

From: Assistant Field Manager, Nonrenewable Resources, Ely, Nevada

Subject: Request for Species List for the White Pine Energy Power Project

The Ely Field Office of the Nevada Bureau of Land Management would like to request a species list for the White Pine Energy Power Project. The proposed action seeks to construct an electric generating facility on approximately 1,300 acres consisting of a coal fired generating plant including steam generators, steam turbine generators, and air pollution control equipment. Additional related structures and facilities would include access roads, railroad facilities, water supply facilities and pipeline facilities, electrical transmission facilities, impoundments, fuel unloading and storage facilities, solid waste disposal facilities, potable water system, septic system, and parking areas.

The preferred and alternate site, are located north of Ely, Nevada on Highway 93 as shown on the map, legal description and CD sent to the USFWS on June 3, 2004. White Pine Energy's proposal is to avoid sensitive areas as much as possible.

If you have any questions please call Doris Metcalf at (775) 289-1852 or by e-mail at [Doris\\_Metcalf@nv.blm.gov](mailto:Doris_Metcalf@nv.blm.gov).

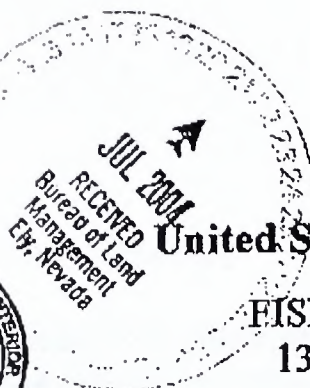
Sincerely,

/S/ Jeffrey A. Weeks

Jeffrey A. Weeks  
Assistant Field Manager  
Nonrenewable Resources

Dmetcalf:dam





**United States Department of the Interior**

**FISH AND WILDLIFE SERVICE**

1340 Financial Blvd., Suite 234

Reno, Nevada 89502

Ph: 775-861-6300 ~ Fax: 775-861-6301



July 19, 2004  
File No. 1-5-04-SP-207

Mr. Jeffrey Weeks  
Bureau of Land Management  
Ely Field Office  
HC 33 Box 33500  
702 No. Industrial Way  
Ely, Nevada 89301-9408

Dear Mr. Weeks:

Subject: Species List for White Pine Energy Power Project, White Pine  
County, Nevada

In response to your letter received on June 18, 2004, the following federal listed and candidate species may occur in the White Pine Energy Power Project area:

1. Bald eagle (*Haliaeetus leucocephalus*), threatened
2. Yellow-billed cuckoo (*Coccyzus americanus*) (Western US DPS),  
candidate

This list fulfills the requirement of the Fish and Wildlife Service (Service) to provide information on listed species pursuant to section 7(c) of the Endangered Species Act of 1973, as amended (Act), for projects that are authorized, funded, or carried out by a Federal agency. Candidate species, like the Western yellow-billed cuckoo, receive no legal protection under the Act. However the Yellow-billed cuckoo is protected under the Migratory Bird Treaty Act (MBTA). Consideration of candidate species during project planning may assist species conservation efforts and may prevent the need for future listing actions.

The Nevada Fish and Wildlife Office no longer provides species of concern lists. Most of these species for which we have concern, are also on the sensitive species list for Nevada maintained by the State of Nevada's Natural Heritage Program (Heritage). Instead of maintaining our own list, we are adopting Heritage's sensitive species list and partnering with them to provide distribution data and information on the conservation needs for sensitive species to agencies or project proponents. The mission of Heritage is to continually evaluate the conservation priorities of native plants, animals, and their habitats, particularly those most vulnerable to extinction or

are in serious decline. Consideration of these sensitive species and exploring management alternatives early in the planning process can provide long-term conservation benefits and avoid future conflicts.

For a list of sensitive species by county, visit Heritage's website at [www.heritage.nv.gov](http://www.heritage.nv.gov). For a specific list of sensitive species that may occur in the project area, you can obtain a data request form from the website or by contacting Heritage at 1550 East College Parkway, Suite 137, Carson City, NV 89706, 775-687-4245. Please indicate on the form that your request is being obtained as part of your coordination with the Service under the Endangered Species Act. During your project analysis, if you obtain new information or data for any Nevada sensitive species, we request that you provide the information to Heritage at the above address. Furthermore, certain species of fish and wildlife are classified as protected by the State of Nevada (see [http://www.leg.state.nv.us/NAC/NAC\\_503.html](http://www.leg.state.nv.us/NAC/NAC_503.html)). Before a person can hunt, take, or possess any parts of wildlife species classified as protected, they must first obtain the appropriate license, permit, or written authorization from the Nevada Department of Wildlife (visit <http://www.ndow.org> or call 775-777-2300).

We are concerned that the project may impact the Monte Neva paintbrush (*Castilleja salsuginosa*), species listed as sensitive under the Heritage Program. This species is also listed as critically endangered by the State of Nevada under Nevada Revised Statutes (NRS) 527.260-.300. For this species, no member of its kind may be removed or destroyed at any time by any means except under special permit issued by the State Forester (NRS 527.270). Requests for permits should be directed to the State Forester, Nevada Division of Forestry at 2525 South Carson Street, Carson City, Nevada 89701, (775) 684-2500. It should be noted that many of the plant species on the State's critically endangered list are not federally listed by the Service because of the protection afforded to them under the State law. Consideration of this species during project planning and early coordination with the State is important to assist with species conservation efforts and to prevent the need for Federal listing actions in the future.

We note that the greater sage grouse (*Centrocercus urophasianus*), a species listed as sensitive under the Heritage Program occurs within White Pine Energy Power Project area. The Western States Sage and Columbian Sharp-tailed Grouse Technical Committee, under direction of the Western Association of Fish and Wildlife Agencies, has developed and published guidelines to manage and protect sage grouse and their habitats in the Wildlife Society Bulletin (Connelly *et al.* 2000). We ask that you consider incorporating these guidelines (available at <http://www.sagemap.wr.usgs.gov>) as you plan and implement your project. Additionally we request that you follow any pertinent management recommendations for this species contained in the White Pine County Portion (Lincoln/White Pine Planning Area) Sage Grouse Conservation Plan (NDOW 2004).

We also note that the pygmy rabbit (*Brachylagus idahoensis*) could be present within the project areas. As such we are concerned that the project could potentially impact this species which has been petitioned for listing under the Act. Draft survey guidelines have been developed for this

species and are available upon request from the Nevada Fish and Wildlife Office. We encourage you to survey the proposed project areas for pygmy rabbits prior to any ground disturbing activities and to consider the needs of this species as you complete project planning and implementation.

Also based on the Service's conservation responsibilities and management authority for migratory birds under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 *et. seq.*), we are concerned about potential impacts the proposed project may have on migratory birds in the area. Given these concerns, we recommend that any land clearing or other surface disturbance associated with proposed actions within the project area be timed to avoid potential destruction of bird nests or young, or birds that breed in the area. Such destruction may be in violation of the MBTA. Under the MBTA, nests (nests with eggs or young) of migratory birds may not be harmed, nor may migratory birds be killed. Therefore, we recommend land clearing be conducted outside the avian breeding season. If this is not feasible, we recommend a qualified biologist survey the area prior to land clearing. If nests are located, or if other evidence of nesting (*i.e.*, mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species) should be delineated and the entire area avoided to prevent destruction or disturbance to nests until they are no longer active.

Because wetlands, springs, or streams are present in the vicinity of the proposed White Pine Energy Power Project area, we ask that you be aware of potential impacts project activities may have on these areas. Discharge of fill material into wetlands or waters of the United States is regulated by the U.S. Army Corps of Engineers (Corps) pursuant to section 404 of the Clean Water Act of 1972, as amended. We recommend you contact the Corps' Regulatory Section [insert 300 Booth Street, Room 2103, Reno, Nevada 89509, (775) 784-5304 or 321 North Mall Drive, Suite L-101, St. George, Utah 84790-7314, (435) 986-3979] regarding the possible need for a permit.

Finally we note that springs occur on or near the proposed project site. These springs are sensitive to a wide variety of activities and may be occupied by rare aquatic organisms (macroinvertebrates) that may be affected by the proposed action. Recent studies have found approximately 100 species of aquatic macroinvertebrates in springs and springbrooks throughout the western United States, including springsnails, caddisflies, beetles, true bugs, and crustaceans. There is concern for these species because some are narrowly distributed and, in many cases, their habitats have become highly degraded. Many springs in Nevada have not yet been surveyed to determine if they are occupied by macroinvertebrates. For those which have been surveyed, gravel substrate, flowing high quality water, and minimal disturbance are believed to be important habitat components to maintain viable populations of these species. As you may be aware, your agency is a signatory to a 1998 multi-party Memorandum of Understanding (MOU) concerning the cooperative effort to conserve springsnails and their habitats in the Great Basin. We ask that you include measures in your project planning and implementation to protect the springs, springsnails and other macroinvertebrates, and coordinate your measures to protect this important habitat with the partners and efforts underway as part of the MOU.

Mr. Weeks

File No. 1-5-04-SP-207

Please reference File No. 1-5-04-SP-207 in future correspondence concerning this species list. If you have any questions regarding this correspondence or require additional information, please contact me or Kevin Kritz at (775) 861-6300.

Sincerely,

*Stanley M. Wiernyes*

for Robert D. Williams  
Field Supervisor



# United States Department of the Interior

## BUREAU OF LAND MANAGEMENT

Ely Field Office  
HC 33 Box 33500 (702 No. Industrial Way)  
Ely, Nevada 89301-9408  
<http://www.nv.blm.gov/ely>



In Reply Refer To:  
N-78091  
2850 (NV-043)

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

USFWS Region 1  
Ecological Services  
Attn: Stanley Wiemeyer  
1340 Financial Blvd. Suite 234  
Reno, Nevada 89502

**Re: Request for Concurrence of Federally Listed Species and Habitat Concerns, White Pine Energy Station Project, White Pine County, Nevada**

Dear Mr. Wiemeyer,

Bureau of Land Management (BLM) requests concurrence from the U.S. Fish and Wildlife Service (the Service) on special status species and habitat concerns in a proposed project area for the White Pine Energy Station Project (the Project) submitted by White Pine Energy Associates (WPEA), the majority of which is to be located on Public Lands in White Pine County, Nevada. Prior correspondence with the Service as well as with the Nevada Department of Wildlife (NDOW) regarding the Project occurred on June 18, 2004. The Service response was received by the BLM on July 19, 2004 (Reference File No. 1-5-04-SP-207). These prior communications provided the focus for gathering initial information used in the review of species of concern in the proposed project area. More than a year and a half has passed since the original correspondence, and this letter is to request an updated list of species and habitats of concern for the White Pine Energy Station Project.

The original proposal from WPEA, described in the June 2004 letter, included the construction of a power plant using water cooling technology and a single electric transmission line within the 200 foot right-of-way (ROW) of the Southwest Intertie Project (SWIP) corridor. Assessment of proposed project impacts has lead to some alterations to the original proposal. As revised in December 2005, the Project now includes construction of a power plant using dry cooling technology, an increased width of the transmission corridor from the power plant to the SWIP ROW from 200 to 500 feet to accommodate as many as three separate electric transmission lines, and a reduction in the length of the water supply system. The power plant and associated features (electric transmission facilities, water supply system, rail spur, and access road) are proposed to be located primarily on public lands managed by the Ely Field Office of BLM as shown on the attached maps.

With proposed construction on public lands managed by BLM, the Project must comply with a host of local, state, and federal regulations including the National Environmental Policy Act (NEPA) and BLM regulations. An Environmental Impact Statement (EIS) is being prepared to analyze the Project and is expected to be in draft form in 2006. The following information provides a brief description of the Project and a summary of the resource analysis that will be more fully addressed in the EIS. To comply with Endangered Species Act (ESA) Section 7 consultation requirements, a Biological Assessment (BA) will also be completed and submitted to the Service for concurrence in 2006.

### **Project Description**

The White Pine Energy Station Project is proposed by WPEA to supply reliable, low-cost electricity in an environmentally responsible manner to meet base load energy needs in Nevada and the western United States beginning in 2010, and to bring economic benefits to White Pine County, Nevada. WPEA is proposing to locate the Project on public lands managed by the BLM.

### **Environmental setting**

The majority of the Project lies within Steptoe Valley just north of the town of McGill, Nevada with a portion also crossing the Egan Mountain Range into Butte Valley directly to the west of Steptoe Valley. The Proposed project area is dominated by sagebrush shrublands and pinyon-juniper woodlands. Topography is characterized by high mountain ranges interspersed with valleys, known as basin and range topography. The community types found within the proposed project area include; sagebrush shrublands, salt desert scrub, pinyon-juniper woodlands, greasewood playa, greasewood dunes, rabbit brush, and wetlands.

The primary hydrologic feature within the proposed project area is Duck Creek. The U.S. Army Corp of Engineers has determined that Duck Creek is not a "jurisdictional waters of the U.S." and therefore will not be subject to regulation under Section 404 of the Clean Water Act. Wetlands associated with Duck Creek provide habitat for resident and migratory species. Numerous natural springs with associated wetlands and riparian communities occur in Steptoe Valley.

### **Federal Species of Concern**

The Service previously listed the following federal species of concern as having the potential to occur within the White Pine Energy Station Project area:

- Bald eagle (*Haliaeetus leucocephalus*) – Listed Threatened
- Yellow-billed cuckoo (*Coccyzus americanus*) – Candidate

Bald Eagles are known to migrate through Steptoe Valley in the winter and can be found foraging south of the proposed project area, around Basset Lake, and along stretches of Duck Creek. No critical habitat for the bald eagle has been identified within the proposed project area.

The absence of woody riparian habitats within the proposed project area means there is no

suitable breeding habitat for the yellow-billed cuckoos within the proposed project area.

### **Conclusion**

BLM will address potential project impacts to federally listed, proposed, or candidate species in the BA; other species of State and BLM concern mentioned in your previous letter will be addressed in the EIS. To ensure that federal species of concern are appropriately addressed, BLM requests an updated list of species of fish and wildlife species that are of federal concern for the White Pine Energy Station Project. In addition, any additional concerns or recommendations regarding the project would be welcomed.

If you have any questions please call Susan Baughman at (775) 289-1827, or Doris Metcalf at (775) 289-1852.

Sincerely,

Jeffery A. Weeks  
Assistant Field Manager  
Nonrenewable Resources

### **Attachment**

- 1) Maps (2)





# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Nevada Fish and Wildlife Office

1340 Financial Blvd., Suite 234

Reno, Nevada 89502

Ph: (775) 861-6300 ~ Fax: (775) 861-6301

Bureau of Land Management

MAR 08 2006

February 23, 2006

File No: 1-5-06-SP-066

RECEIVED

Ely, NV

### Memorandum

To: Field Manager, Bureau of Land Management, Ely Field Office, Ely, Nevada  
(Attn: J. Weeks)

From: Field Supervisor, Nevada Fish and Wildlife Office, Reno, Nevada

Subject: Updated Species List for White Pine Energy Station Project,  
White Pine County, Nevada

In response to your letter received on January 31, 2006, the following federally listed species may occur in the White Pine Energy Station Project area:

- Bald eagle (*Haliaeetus leucocephalus*), threatened

This list fulfills the requirement of the Fish and Wildlife Service (Service) to provide information on listed species pursuant to section 7(c) of the Endangered Species Act of 1973, as amended (Act), for projects that are authorized, funded, or carried out by a Federal agency.

The Nevada Fish and Wildlife Office no longer provides species of concern lists. Most of these species for which we have concern are also on the sensitive species list for Nevada maintained by the State of Nevada's Natural Heritage Program (Heritage). Instead of maintaining our own list, we are adopting Heritage's sensitive species list and partnering with them to provide distribution data and information on the conservation needs for sensitive species to agencies or project proponents. The mission of Heritage is to continually evaluate the conservation priorities of native plants, animals, and their habitats, particularly those most vulnerable to extinction or in serious decline. Consideration of these sensitive species and exploring management alternatives early in the planning process can provide long-term conservation benefits and avoid future conflicts.

TAKE PRIDE  
IN AMERICA

For a list of sensitive species by county, visit Heritage's website at [www.heritage.nv.gov](http://www.heritage.nv.gov). For a specific list of sensitive species that may occur in the project area, you can obtain a data request form from the website or by contacting Heritage at 901 South Stewart Street, Suite 5002, Carson City, Nevada 89701, 775-684-2900. Please indicate on the form that your request is being obtained as part of your coordination with the Service under the Act. During your project analysis, if you obtain new information or data for any Nevada sensitive species, we request that you provide the information to Heritage at the above address. Furthermore, certain species of fish and wildlife are classified as protected by the State of Nevada (see [http://www.leg.state.nv.us/NAC/NAC\\_503.html](http://www.leg.state.nv.us/NAC/NAC_503.html)). Before a person can hunt, take, or possess any parts of wildlife species classified as protected, they must first obtain the appropriate license, permit, or written authorization from the Nevada Department of Wildlife (visit <http://www.ndow.org> or call 775-777-2300).

We are concerned that the project may impact the Monte Neva paintbrush (*Castilleja salsuginosa*), a plant species listed as sensitive under the Heritage Program. This species is also listed as critically endangered by the State of Nevada under Nevada Revised Statutes (NRS) 527.260-300. For this species, no member of its kind may be removed or destroyed at any time by any means except under special permit issued by the State Forester (NRS 527.270). Requests for permits should be directed to the State Forester, Nevada Division of Forestry at 2525 South Carson Street, Carson City, Nevada 89701, (775) 684-2500. It should be noted that many of the plant species on the State's critically endangered list are not federally listed by the Service because of the protection afforded to them under the State law. Consideration of this species during project planning and early coordination with the State is important to assist with species conservation efforts and to prevent the need for Federal listing actions in the future.

We are concerned that the proposed project may impact the sage grouse (*Centrocercus urophasianus*), which is a species of heightened concern. The Western States Sage and Columbian Sharp-tailed Grouse Technical Committee, under the direction of the Western Association of Fish and Wildlife Agencies, has developed and published guidelines to manage and protect sage grouse and their habitats in the Wildlife Society Bulletin (Connelly *et al.* 2000). We recommend that these guidelines be used in the planning process to provide further conservation for this species. These guidelines are available at: [http://sagemap.wr.usgs.gov/docs/sage\\_grouse\\_guidelines.pdf](http://sagemap.wr.usgs.gov/docs/sage_grouse_guidelines.pdf). On a more local level, the Sage Grouse Conservation Plan for Nevada and Portions of Eastern California was completed in June 2004. The Plan is available online at: <http://www.ndow.org/wild/sg/plan/index.shtm>. We encourage you to adopt all appropriate management guidance from this Plan as you implement your proposed action. Additionally, we request that you follow any pertinent management recommendations for this species contained in the White Pine County Portion (Lincoln/White Pine Planning Area) of the Plan (NDOW 2004).

We are concerned that the project may impact the pygmy rabbit (*Brachylagus idahoensis*). In Nevada, the Bureau of Land Management (BLM) includes this species on their sensitive species list. Also the BLM State Director for Nevada has directed all Field Office staff in Nevada to

make it a priority to address the pygmy rabbit in all of their upcoming Land Use Plan revisions. On May 20, 2005, the Service published a non-substantial 90-day finding determination on a petition to list the pygmy rabbit as threatened or endangered under the Act. Though the pygmy rabbit is not currently a federally-listed species, we continue to monitor the species' status, and we remain concerned about impacts to pygmy rabbit populations. Draft survey guidelines have been developed for this species and are available upon request from the Nevada Fish and Wildlife Office. We encourage you to survey the proposed project area for pygmy rabbits prior to any ground disturbing activities and to consider the needs of this species as you complete project planning and implementation.

Based on the Service's conservation responsibilities and management authority for migratory birds under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 *et seq.*), we are concerned about potential impacts the proposed project may have on migratory birds in the area. Given these concerns, we recommend that any land clearing or other surface disturbance associated with proposed actions within the project area be timed to avoid potential destruction of bird nests or young, or birds that breed in the area. Such destruction may be in violation of the MBTA. Under the MBTA, nests (nests with eggs or young) of migratory birds may not be harmed, nor may migratory birds be killed. Therefore, we recommend land clearing be conducted outside the avian breeding season. If this is not feasible, we recommend a qualified biologist survey the area prior to land clearing. If nests are located, or if other evidence of nesting (*i.e.*, mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species) should be delineated and the entire area avoided to prevent destruction or disturbance to nests until they are no longer active.

Because wetlands, springs, or streams are present in the vicinity of the proposed White Pine Energy Power Project area, we ask that you be aware of potential impacts project activities may have on these areas. Discharge of fill material into wetlands or waters of the United States is regulated by the U.S. Army Corps of Engineers (Corps) pursuant to section 404 of the Clean Water Act of 1972, as amended. We recommend you contact the Corps' Regulatory Section [300 Booth Street, Room 2103, Reno, Nevada 89509, (775) 784-5304] regarding the possible need for a permit.

Finally we note that springs occur on or near the proposed project site. These springs are sensitive to a wide variety of activities and may be occupied by rare aquatic organisms (macroinvertebrates) that may be affected by the proposed action. Recent studies have found approximately 100 species of aquatic macroinvertebrates in springs and springbrooks throughout the western United States, including springsnails, caddisflies, beetles, true bugs, and crustaceans. There is concern for these species because some are narrowly distributed and, in many cases, their habitats have become highly degraded. Many springs in Nevada have not yet been surveyed to determine if they are occupied by macroinvertebrates. For those which have been surveyed, gravel substrate, flowing high quality water, and minimal disturbance are believed to be important habitat components to maintain viable populations of these species. As you may be

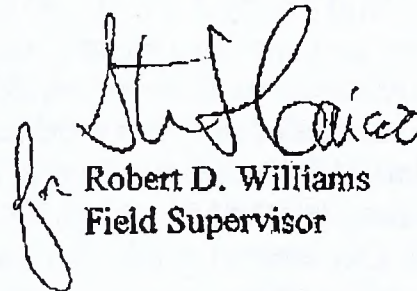
Mr. Jeffrey Weeks

File No. 1-5-06-SP-066

aware, your agency is a signatory to a 1998 multi-party Memorandum of Understanding (MOU) concerning the cooperative effort to conserve springsnails and their habitats in the Great Basin. We ask that you include measures in your project planning and implementation to protect the springs, springsnails and other macroinvertebrates, and coordinate your measures to protect this important habitat with the partners and efforts underway as part of the MOU.

Please reference File No. 1-5-06-SP-066 in future correspondence concerning this species list. If you have any questions regarding this correspondence or require additional information, please contact me or Marcy Haworth at (775) 861-6300.

Sincerely,

A handwritten signature in dark ink, appearing to read "R. Williams", is written over the typed name. The signature is fluid and cursive, with a large initial "R" and a long, sweeping underline.

Robert D. Williams  
Field Supervisor

## References

Sage-Grouse Conservation Team. 2004. Greater Sage-Grouse Conservation Plan for Nevada and Eastern California. Nevada Department of Wildlife, Reno, Nevada, 108 pp. plus appendices.



Appendix E

## Visual Inventory Forms



# White Pine Project

## Visual Contrast Rating Worksheet: Proposed Action

EDAW/CH2M HILL

Project Name	White Pine		
Alternative	Proposed Action		
KOP	KOP 1: Cherry Creek		
VRM Class	The Proposed Action power plant site is located in areas of both VRM Classes II and III. KOP 1 is located in an area of VRM Class II.		
Distance From KOP	Approximately 12 miles		
Proposed Activity Description: Power Plant			
	Land/Water	Vegetation	Structures
<b>Form</b>	The cleared site would be visible in the distance from this location as would the evaporation ponds.	The rectangular shape of the partially cleared site and project facilities would contrast with adjacent and nearby vegetated areas.	The concave cylindrical shape of the cooling towers would be clearly seen when looking down into Steptoe Valley from this location. Other large facilities such as the stacks and coal storage areas along with the power plant would also be seen, but would not be as visible as the cooling towers.
<b>Line</b>			The cooling towers and stacks would be visible vertical elements.
<b>Color</b>	Brownish – gray earth colors. Cleared areas would be the color of the graded earth (browns).	Some existing vegetation would be removed and some would be left in place.	The concrete cooling towers would contrast in color with the adjacent landscape. Over time the color of the concrete would darken and the contrast would be less. Other facilities would be painted earth tones to reduce visual impacts. Coal storage areas would be black.
<b>Texture</b>			The texture of facilities would not be noticed much from this distance.
<b>Degree of Contrast</b> 1 = Strong 2 = Moderate 3 = Weak 4 = None	Land/Water	Vegetation	Structures
<b>Form</b>	3	3	2
<b>Line</b>	4	4	3
<b>Color</b>	3	3	3
<b>Texture</b>	3	4	3

## ***White Pine Project***

### ***Visual Contrast Rating Worksheet: Proposed Action***

EDAW/CH2M HILL

**Does design meet VRM Class management objectives?** Yes for both VRM Class II and III.

**Explain:** The view from this KOP into Steptoe Valley is very expansive. The Proposed Action would be a small part of that view. The cooling towers would be very visible from this location but would not be silhouetted against the sky, which would reduce their visual impact. Cherry Creek is far enough away from the site that most of the rest of the project facilities would not be visually distinct. Changes to the overall characteristic landscape would occur, but would be "low," so VRM Classes II and III objectives would be met.

**Additional mitigation measures recommended.** None.

# ***White Pine Project***

## ***Visual Contrast Rating Worksheet: Proposed Action***

EDAW/CH2M HILL

Project Name	White Pine		
Alternative	Proposed Action		
KOP	KOP 2: Pony Express Route & CR 18 (visual simulation prepared for this KOP)		
VRM Class	The Proposed Action power plant site is located in areas of both VRM Classes II and III. KOP 2 is located in an area of VRM Class II.		
Distance From KOP	Approximately 4.5 miles		
Proposed Activity Description: Power Plant			
	Land/Water	Vegetation	Structures
<b>Form</b>	The cleared site would not be seen from this viewing distance.	Vegetation that would be removed would be too far away to be seen in any detail from this location.	The concave cylindrical shape of the cooling towers and the cylindrical shape of the stacks would be very visible in front of mountains in the background from this location (but would not be silhouetted against the sky). A variety of large-scale block-like and angular forms of various project facilities associated with the power plant would also be visible from this KOP.
<b>Line</b>			Cooling towers and stacks would be visible as vertical elements from this location. Parts of some long horizontal facilities (coal storage areas and storage berms) would also be seen.
<b>Color</b>	Brownish – gray earth colors.	Sage green and grays.	The concrete cooling towers and stacks would be noticed and their color would contrast to some degree with the adjacent landscape and sky. Other smaller facilities that would be painted earth tones to reduce visual impacts would be less visible.
<b>Texture</b>			The smooth concrete of the cooling towers would be noticeable. The texture of other facilities would not be noticed as much from this distance.

## ***White Pine Project***

### ***Visual Contrast Rating Worksheet: Proposed Action***

EDAW/CH2M HILL

Degree of Contrast 1 = Strong 2 = Moderate 3 = Weak 4 = None	Land/Water	Vegetation	Structures
Form	3	4	2
Line	3	4	2
Color	2	4	2
Texture	3	4	3

**Does design meet VRM Class management objectives?** Yes for VRM Class III objectives and no for VRM Class II objectives.

**Explain:** The distance (4.5 miles) between the KOP and the Proposed Action power plant site is great enough that changes to the existing land and vegetation would not be very (or at all) noticeable. Larger facilities such as the cooling towers and stacks, and the top of the power plant would be seen to the south by people driving east or west on this section of County Road 18. The cooling towers and stacks would be silhouetted against the sky, which would increase their visibility. Changes to the characteristic landscape would be “moderate” and would meet VRM Class III objectives. VRM Class II objectives allow a “low” level of change to the characteristic landscape and thus would not be met.

Changes to the characteristic landscape as a result of the cleared water pipeline right-of-way would be noticed from this KOP, but only for a short time by people driving past the KOP location and looking to the immediate left or right (and up the cleared right-of-way). The VRM objectives for Classes II and III would be met.

**Additional mitigation measures recommended.** None.

# White Pine Project

## Visual Contrast Rating Worksheet: Proposed Action

EDAW/CH2M HILL

Project Name	White Pine		
Alternative	Proposed Action		
KOP	KOP 3: Lincoln Highway (visual simulation prepared for this KOP)		
VRM Class	The Proposed Action power plant site is located in areas of both VRM Classes II and III. KOP 3 is located in an area of VRM Class III.		
Distance From KOP	Approximately 2.5 miles		
Proposed Activity Description: Power Plant			
	Land/Water	Vegetation	Structures
Form	Relatively flat land would be cleared, but would require relatively little grading. The site would be rectangular in shape and could be partially seen from this KOP.	Existing vegetation would be retained where possible, but extensive areas would be cleared to accommodate project facilities. Cleared areas would be seen from this KOP.	The three concave cylindrically shaped cooling towers and stacks would be very visible from this location, but would not be silhouetted against the sky. In addition, other facilities such as the power block, coal storage areas, substation, and transmission lines would be highly visible from this KOP.
Line			Long horizontal facilities (coal storage areas, storage berms, and transmission lines) and tall vertical facilities (cooling towers and stacks) would be very noticeable from this KOP.
Color	Cleared site would be brown and gray.	Existing vegetation would be removed and some ornamental vegetation would be planted at the facility and seen from this KOP.	The concrete cooling towers would contrast with the adjacent landscape and sky. Other facilities would be painted earth tones to reduce visual impacts. Coal storage areas would be black and would contrast when not covered in snow.
Texture			The texture of facilities would contrast from the nearby landscape when viewed from this distance.
Degree of Contrast 1 = Strong 2 = Moderate 3 = Weak 4 = None	Land/Water	Vegetation	Structures

## *White Pine Project*

### *Visual Contrast Rating Worksheet: Proposed Action*

EDAW/CH2M HILL

Form	3	3	1
Line	3	3	1
Color	3	3	2
Texture	3	3	2

**Does design meet VRM Class management objectives?** No for VRM Classes II and III.

**Explain:** The Proposed Action site and facilities would be very noticeable from this KOP. The cooling towers and stacks would be silhouetted against the sky from this location, which would draw additional viewing attention. The level of change to the landscape seen from this KOP would be “moderate” to “high” and would not meet VRM Classes II or III objectives.

**Additional mitigation measures recommended.** No.

# White Pine Project

## Visual Contrast Rating Worksheet: Proposed Action

EDAW/CH2M HILL

Project Name	White Pine		
Alternative	Proposed Action		
KOP	KOP 4: Highway 93 Turnoff		
VRM Class	The Proposed Action power plant site is located in areas of both VRM Classes II and III. KOP 4 is located in an area of VRM Class III.		
Distance From KOP	Approximately 12 miles		
Proposed Activity Description: Power Plant			
	Land/Water	Vegetation	Structures
Form	Land cleared for site development would not be seen from this KOP.	Vegetation removed for site development would not be seen from this KOP.	The tops of the tallest facilities (primarily the cooling towers and the stacks) could be seen in the distance and would be partially silhouetted against the sky.
Line			Vertical lines from the large facilities mentioned above could be seen. Long horizontal facilities would probably not be seen.
Color			The cooling towers would contrast in color with the adjacent landscape and sky, but because of the distance would not be as noticeable as from closer locations
Texture			Texture of facilities would not be noticed much from this distance.
Degree of Contrast 1 = Strong 2 = Moderate 3 = Weak 4 = None	Land/Water	Vegetation	Structures
Form	4	4	2
Line	4	4	2
Color	4	4	3
Texture	4	4	3

## ***White Pine Project***

### ***Visual Contrast Rating Worksheet: Proposed Action***

**EDAW/CH2M HILL**

**Does design meet VRM Class management objectives?** Yes for both VRM Classes II and III.

**Explain:** This location is far enough away so that although some of the larger facilities would be noticeable, they would lie low on the horizon. Changes to the characteristic landscape would be “low” and as a result, objectives for both VRM Class III and II would be met.

**Additional mitigation measures recommended.** No.

# ***White Pine Project***

## ***Visual Contrast Rating Worksheet: Proposed Action***

**EDAW/CH2M HILL**

Project Name	<b>White Pine</b>		
Alternative	<b>Proposed Action</b>		
KOP	<b>KOP 5: McGill</b>		
VRM Class	<b>The Proposed Action power plant site is located in areas of both VRM Classes II and III. KOP 5 is located in an area of VRM Class III.</b>		
Distance From KOP	<b>Approximately 21 miles</b>		
<b>Proposed Activity Description: Power Plant</b>			
	<b>Land/Water</b>	<b>Vegetation</b>	<b>Structures</b>
<b>Form</b>			This KOP is within the seen area of the Proposed Action site. Viewers could see the tops of some of the taller structures such as the cooling towers and the stacks in the distance. The tops of these structures might be silhouetted against the sky or background mountains, but due to the distance, would be barely noticed.
<b>Line</b>			Tops of structures could be seen silhouetted against the sky.
<b>Color</b>			May see a slight contrast in the concrete color of the cooling towers.
<b>Texture</b>			Not seen.
<b>Degree of Contrast</b> 1 = Strong 2 = Moderate 3 = Weak 4 = None	<b>Land/Water</b>	<b>Vegetation</b>	<b>Structures</b>
<b>Form</b>	4	4	3
<b>Line</b>	4	4	3
<b>Color</b>	4	4	4
<b>Texture</b>	4	4	4

## ***White Pine Project***

### ***Visual Contrast Rating Worksheet: Proposed Action***

**EDAW/CH2M HILL**

**Does design meet VRM Class management objectives?** Yes for both VRM Classes II and III.

**Explain:** Changes to the characteristic landscape from this KOP would be very low, which would meet the objectives of VRM Class II and exceed the objectives of Class III.

**Additional mitigation measures recommended.** No.

# ***White Pine Project***

## ***Visual Contrast Rating Worksheet: Proposed Action***

EDAW/CH2M HILL

Project Name	White Pine		
Alternative	Proposed Action		
KOP	KOP 6: Highway 50		
VRM Class	VRM Class III		
Distance From KOP	Within ¼ mile		
Proposed Activity Description: Transmission Line and Substation			
	Land/Water	Vegetation	Structures
Form	Cleared right-of-way would introduce rectilinear forms where seen.		The tower structures would introduce geometric forms to the landscape.
Line	300-foot wide right-of-way cleared of large vegetation would introduce rectilinear forms where seen.	300-foot wide right-of-way cleared of large vegetation will follow the transmission line.	Transmission line conduit would cross over the highway.
Color		Cleared right-of-way would change type and color of exiting vegetation.	
Texture			
Degree of Contrast 1 = Strong 2 = Moderate 3 = Weak 4 = None	Land/Water	Vegetation	Structures
Form	2	2	2
Line	2	2	3
Color	3	3	3
Texture	3	3	3

## ***White Pine Project***

### ***Visual Contrast Rating Worksheet: Proposed Action***

**EDAW/CH2M HILL**

**Does design meet VRM Class management objectives?** Yes, the objectives of VRM Class III would be met.

**Explain:** Only part of the cleared right-of-way would be seen. The most visible elements would be the tower structures. Changes to the characteristic landscape from this KOP would be low to moderate, which would meet or exceed the objectives of VRM Class III. The substation would be screened from view from the highway by a small hill.

**Additional mitigation measures recommended.** None.

# ***White Pine Project***

## ***Visual Contrast Rating Worksheet: Alternative 1***

EDAW/CH2M HILL

Project Name	White Pine		
Alternative	Alternative 1		
KOP	KOP 1: Cherry Creek		
VRM Class	VRM Class II and III		
Distance From KOP	Approximately 23 miles		
Proposed Activity Description: Power Plant			
	Land/Water	Vegetation	Structures
Form	Not seen.	Not seen.	Tops of three cooling towers in seen area, may see tops in distance.
Line	Not seen.	Not seen.	Tops of three cooling towers in seen area, may see tops in distance.
Color	Not seen.	Not seen.	Tops of three cooling towers in seen area, may see tops in distance.
Texture	Not seen.	Not seen.	NA
Degree of Contrast 1 = Strong 2 = Moderate 3 = Weak 4 = None	Land/Water	Vegetation	Structures
Form	NA	NA	4
Line	NA	NA	4
Color	NA	NA	4
Texture	NA	NA	NA

**Does design meet VRM Class management objectives?** Yes for Class III (not seen).

**Explain:** Other than the tops of the three cooling towers and stacks (which would be 23 miles away), none of the Alternative 1 site would be seen from KOP 1.

**Additional mitigation measures recommended.** None.

# *White Pine Project*

## *Visual Contrast Rating Worksheet: Alternative 1*

EDAW/CH2M HILL

Project Name	White Pine		
Alternative	Alternative 1		
KOP	KOP 2: Pony Express Route (County Road 18)		
VRM Class	VRM Class III		
Distance From KOP	Approximately 15 miles		
Proposed Activity Description: Power Plant			
	Land/Water	Vegetation	Structures
Form	Not seen.	Not seen.	The tops of three cooling towers and stacks could be visible in distance silhouetted against the sky.
Line	Not seen.	Not seen.	The tops of three cooling towers and stacks could be visible in distance silhouetted against the sky.
Color	Not seen.	Not seen.	Would blend in fairly well, although stacks could be visible in the distance.
Texture	Not seen.	Not seen.	Too far to see texture.
Degree of Contrast 1 = Strong 2 = Moderate 3 = Weak 4 = None	Land/Water	Vegetation	Structures
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	4
Does design meet VRM Class management objectives? Yes for VRM Class III.			
Explain: Other than the tops of the three cooling towers and stacks (which would be 15 miles away), none of the Alternative 1 site would be seen from KOP 2.			
Additional mitigation measures recommended. None.			

# White Pine Project

## Visual Contrast Rating Worksheet: Alternative 1

EDAW/CH2M HILL

Project Name	White Pine		
Alternative	Alternative 1		
KOP	KOP 3: Lincoln Highway		
VRM Class	VRM Class III		
Distance From KOP	Approximately 7 miles away		
Proposed Activity Description: Power Plant			
	Land/Water	Vegetation	Structures
Form	KOP too far away to notice changes to site.	KOP too far away to be able to see disturbed vegetation.	Inverted cylindrical shape of the cooling towers would be visible as would some long horizontal facilities (coal storage areas and storage berms) and some long vertical facilities (stacks).
Line			Inverted cylindrical shape of the cooling towers would be visible as would stacks and some long horizontal facilities (coal storage areas and storage berms).
Color	Brownish – gray earth colors.	Sage green and grays.	The untreated concrete of the three cooling towers would be noticed and would contrast to some degree with the adjacent landscape and sky. Other facilities that would be painted earth tones to reduce visual impacts would be less visible.
Texture			The smooth concrete of the cooling towers might be noticeable. The texture of facilities would not be noticed much from this distance.
Degree of Contrast 1 = Strong 2 = Moderate 3 = Weak 4 = None	Land/Water	Vegetation	Structures
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	3

## ***White Pine Project***

### ***Visual Contrast Rating Worksheet: Alternative 1***

EDAW/CH2M HILL

**Does design meet VRM Class management objectives?** Yes for Class III.

**Explain:** Changes to the viewed landscape from this KOP would be low, which would exceed the objectives of VRM Class III.

**Additional mitigation measures recommended.** No.

# White Pine Project

## Visual Contrast Rating Worksheet: Alternative 1

EDAW/CH2M HILL

Project Name				White Pine			
Alternative				Alternative 1			
KOP				KOP 4: Highway 93 Turnoff [Simulation developed for this KOP]			
VRM Class				VRM Class III			
Distance From KOP				Approximately 1 mile			
Proposed Activity Description: Power Plant							
		Land/Water		Vegetation		Structures	
Form		Alternative 1 facilities would visually interrupt the extensive flat plane of the valley floor (as does the highway).		Vegetation would be removed and replaced with facilities and cleared areas.		The facility structures would be very apparent from this location and would introduce new geometric forms into the seen landscape.	
Line		The coal storage and berms for the evaporation pond and waste storage areas would introduce long horizontal shapes to the landscape.				The cooling towers and stacks would add large vertical "lines" to the landscape that would be silhouetted against the sky from this location.	
Color		The dark color of the coal being stored would contrast with the surrounding landscape.				The untreated concrete of the three cooling towers and the colors of other project facilities would contrast with the adjacent landscape and sky and would be very noticeable.	
Texture						The texture of the facilities would be coarser than that of the nearby landscape.	
Degree of Contrast 1 = Strong 2 = Moderate 3 = Weak 4 = None		Land/Water		Vegetation		Structures	
Form		1		2		1	
Line		1		3		2	
Color		2		3		2	
Texture		3		3		3	

## ***White Pine Project***

### ***Visual Contrast Rating Worksheet: Alternative 1***

EDAW/CH2M HILL

Does design meet VRM Class management objectives? No.

**Explain:** Objectives for Class III lands include partially retaining the existing character of the landscape and keeping the level of change to a characteristic landscape moderate. Due to the closeness of the KOP and scale of the proposed project's facilities, VRM Class III objectives would not be met.

**Additional mitigation measures recommended.** None.

# ***White Pine Project***

## ***Visual Contrast Rating Worksheet: Alternative 1***

**EDAW/CH2M HILL**

Project Name	White Pine		
Alternative	Alternative 1		
KOP	KOP 5: McGill		
VRM Class	VRM Class III		
Distance From KOP	Approximately 10.5 miles north		
Proposed Activity Description: Power Plant			
	<b>Land/Water</b>	<b>Vegetation</b>	<b>Structures</b>
<b>Form</b>	Flat land would be cleared, but would require relatively little grading. Area would be rectangular in shape. KOP too far away to notice.	Site vegetated with sage brush community plants would be cleared. KOP too far away to be able to see disturbed vegetation.	The tops of the three cooling towers (and stacks) could be seen silhouetted above the mountains surrounding Steptoe Valley from this location. A variety of large-scale block-like and angular forms of project various facilities would be visible from this KOP.
<b>Line</b>			Inverted cylindrical shape of the cooling towers would be visible.
<b>Color</b>	Brownish – gray earth colors.	Sage green and grays.	The untreated concrete of the three cooling towers would be noticed and would contrast to some degree with the adjacent landscape and sky. Other facilities that would be painted earth tones to reduce visual impacts would be less visible.
<b>Texture</b>			The smooth concrete of the cooling towers might be noticeable. The texture of facilities would not be noticed much from this distance.

## ***White Pine Project***

### ***Visual Contrast Rating Worksheet: Alternative 1***

EDAW/CH2M HILL

Degree of Contrast 1 = Strong 2 = Moderate 3 = Weak 4 = None	Land/Water	Vegetation	Structures
Form	4	4	2
Line	4	4	3
Color	4	4	3
Texture	4	4	4

**Does design meet VRM Class management objectives? Yes.**

**Explain:** Changes to the viewed landscape from this KOP would be low, which would exceed the objectives of VRM Class III.

**Additional mitigation measures recommended. No.**

# ***White Pine Project***

## ***Visual Contrast Rating Worksheet: Alternative 1***

**EDAW/CH2M HILL**

<b>Project Name</b>			
<b>White Pine</b>			
<b>Alternative</b>			
<b>Alternative 1</b>			
<b>KOP</b>			
<b>KOP 6: Highway 50</b>			
<b>VRM Class</b>			
<b>VRM Class III</b>			
<b>Distance From KOP</b>			
<b>Within ¼ mile</b>			
<b>Proposed Activity Description: Transmission line</b>			
	<b>Land/Water</b>	<b>Vegetation</b>	<b>Structures</b>
<b>Form</b>	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
<b>Line</b>	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
<b>Color</b>	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
<b>Texture</b>	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
<b>Degree of Contrast</b> 1 = Strong 2 = Moderate 3 = Weak 4 = None	<b>Land/Water</b>	<b>Vegetation</b>	<b>Structures</b>
<b>Form</b>	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
<b>Line</b>	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
<b>Color</b>	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
<b>Texture</b>	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
<b>Does design meet VRM Class management objectives?</b> Same as Proposed Action.			
<b>Explain:</b> Same as Proposed Action.			
<b>Additional mitigation measures recommended.</b> None.			



**Appendix F**

**Programmatic Agreement Among Department of the Interior,  
Bureau of Land Management, Ely District, Nevada and  
the Nevada State Historic Preservation Officer Regarding  
the White Pine Energy Station Project**



How m.



STATE OF NEVADA  
DEPARTMENT OF CULTURAL AFFAIRS

Nevada State Historic Preservation Office

100 N. Stewart Street

Carson City, Nevada 89701

(775) 684-3448 • Fax (775) 684-3442

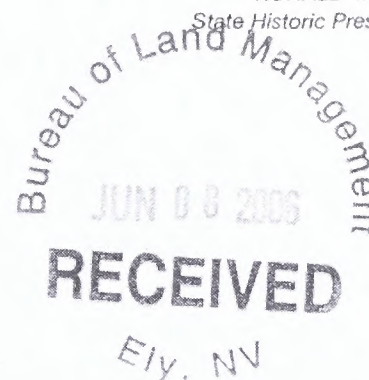
www.nvshpo.org

KENNY C. GUINN  
Governor

SCOTT K. SISCO  
Interim Director

RONALD M. JAMES  
State Historic Preservation Officer

April 25, 2006



Gene A. Kolkman  
Field Manager  
Ely Field Office  
Bureau of Land Management  
HC 33 Box 33500  
Ely, NV 89301-9408

Dear Mr. Kolkman:

Please find enclosed the programmatic agreement regarding the White Pine Energy Station Project. I have reviewed and signed the agreement. The only remaining task is to file a copy with the Advisory Council.

The agreement is well written and easy to understand. I would like to take this opportunity to commend Nate Thomas, archaeologist on your staff, for the hard work and the good results. We look forward to working with your staff on this project.

Sincerely,

ALICE M. BALDRICA, Deputy  
State Historic Preservation Officer

Enc

**PROGRAMMATIC AGREEMENT  
AMONG  
THE DEPARTMENT OF THE INTERIOR,  
BUREAU OF LAND MANAGEMENT, ELY DISTRICT, NEVADA  
AND  
THE NEVADA STATE HISTORIC PRESERVATION OFFICER  
REGARDING THE WHITE PINE ENERGY STATION PROJECT**

WHEREAS, the BLM is considering an application for rights of way and a land disposal for the White Pine Energy Station (WPES) proposed by White Pine Energy Associates, LLC (WPEA) in White Pine County, Nevada, and the BLM is preparing an Environmental Impact Statement for this proposed project;

WHEREAS, WPEA has been invited to participate in consultation and to concur in this Programmatic Agreement;

WHEREAS, the BLM has invited the Advisory Council on Historic Preservation (Advisory Council) to participate in consultation and the Advisory Council has declined this invitation;

WHEREAS, the BLM has determined that the construction and installation of the WPES (the undertaking) may have an effect upon properties eligible for inclusion in the National Register of Historic Places (NRHP), and has consulted with the Nevada State Historic Preservation Officer (SHPO) pursuant to the Nevada BLM/SHPO Protocol for implementing Section 106 of the National Historic Preservation Act (NHPA);

WHEREAS, this Programmatic Agreement covers all aspects of planning, construction, and installation of the undertaking, including but not limited to, electric generation station, power and communication transmission systems, water wells and pipelines, rail spur, staging areas and access roads, the construction zone, extra work areas, and all ancillary facilities;

NOW THEREFORE, the SHPO and the BLM agree that development of the WPES shall be administered in accordance with the following stipulations to ensure that historic and prehistoric properties will be treated to avoid or mitigate effects to the extent practicable, regardless of surface ownership, and to satisfy the BLM's Section 106 responsibilities for all aspects of the undertaking.

**AREA OF POTENTIAL EFFECT**

WPEA proposes to construct an energy station, electric distribution and transmission lines, substations, water lines, water wells, a rail spur and associated facilities such as access roads.

The Area of Potential Effect (APE) shall be defined to include all potential direct and indirect effects to historic properties and Traditional Cultural Properties from any WPEA activities associated with the undertaking. The APE shall include areas of direct effect, although not an

inclusive list, such as the 200-foot-wide transmission line corridor, the electric generation station site, water well sites, substation sites, and other areas involving ground disturbance such as new or improved access roads and other project facilities located outside the transmission line corridor. The APE for rail spurs and water line corridors shall be 300 feet wide. The APE for new and improved access roads outside the transmission line corridor and for new electric distribution lines outside the water line corridor shall be 100 feet wide.

The APE for assessing indirect effects on historic properties will extend one mile from the transmission line corridor and two miles from the proposed electric generation station sites. Indirect effects on historic properties such as the Lincoln Highway, the Nevada Northern Railroad, and the Pony Express Trail shall be addressed per the guidance in Instruction Memoranda No. NV-2004-004 and No. NV 2004-006.

The initial specific APE is mapped on Figure 1. At the discretion of the BLM, the APE may be amended as needed and any amendments will be handled under the terms of this agreement.

## STIPULATIONS

### A. Identification

1. The BLM shall identify interested persons and tribes pursuant to the BLM/SHPO Protocol and the NEPA process (36 CFR 800.8) and involve them, as appropriate, in activities associated with the undertaking. Proprietary cultural resource information data sharing will be contingent upon data sharing agreements, which guarantee appropriate protection of confidential information.
2. The BLM, in consultation with the SHPO, shall ensure that a Class III inventory of all proposed project facilities shall be completed prior to construction.
3. Required inventory shall be completed regardless of the ownership (public or private) of the lands involved and WPEA shall be responsible for gaining access to privately held lands.
4. In areas of direct effect where the ground is heavily disturbed to a depth of greater than 36 inches below the ground surface, or in areas where access is dangerous to survey personnel, portions of the APE may be exempted from Class III inventory in consultation with the BLM.
5. The BLM shall consult with appropriate tribes to identify properties considered to be of traditional religious and cultural importance in areas that would be directly or indirectly affected by the WPES.
6. The BLM shall have the consulting archaeologists use the *Ely Resource Management Plan Planning Model* and the *Great Basin Restoration Initiative: Cultural Resources*

*Landscape Level Planning Model* to identify locations, types, and sensitivity of historic properties anticipated to be affected by the WPES. The findings from this review shall be used to prepare a report on expected archaeological sites in the APE and develop predictions that shall be compared to the actual findings when Class III inventories are conducted.

7. An isolated find is defined as a single artifact, pieces from a single artifact, or unassociated feature. Isolates will be recorded sequentially and listed within the inventory report on a table with IF number, location and description, and plotted on a separate isolated find map within the Class III report.
8. Non-linear sites extending out of the APE for direct effects shall be recorded in their entirety with the exception of very large sites such as town sites, mining complexes, continuous stream/lake terrace sites, or extensive prehistoric quarries or habitation sites. These exceptions shall be approved in advance by the BLM.
9. Linear resources (e.g., railroads, roads, trails, ditches, etc.) crossing and extending beyond the APE for direct effects shall be divided into three groups:
  - a. Roads or linear features with no mention in the BLM Field Office records or included on General Land Office (GLO) plats, no associated features or dateable artifacts, or which have lost all integrity through extensive blading will not be recorded;
  - b. Roads, linear features, or other resources included on GLO plats but which are not associated with features or dateable artifacts, and do not appear to be significant on the basis of known archival data shall be treated as "isolated linear segments." These resources shall be recorded in tabular form and collected data shall include a minimum of two (2) separate GPS points at each end of the linear feature within the APE;
  - c. Roads or other linear features included on GLO plats (especially named roads) or features known from other archival data to be potentially significant, or which have associated features or dateable artifacts, shall be recorded on IMACS site forms.
10. The BLM shall have the consulting archaeologists conduct records searches of GLO plat maps, the National and State Registers of Historic Places, the National Trail System, and conduct a Class I inventory of agency archives to locate potential historic properties within the APE for direct and indirect effects.
  - a. An inventory and photo documentation of historic ranches that potentially may be affected by the undertaking shall be conducted. This inventory shall include ranch complexes greater than 45 years of age where project-related actions (e.g., new overhead transmission lines) could adversely affect the historic setting,

feeling, and association of these properties. This inventory shall involve documentation of each historic ranch property within one mile of the proposed project, including a historic context (date established, individuals involved, etc.). Documentation of architectural resources shall be obtained from public roads. Information on project-related impacts to these properties shall be based on visual resource assessments prepared for the EIS.

b. An inventory of historic properties along and the landscape adjacent to the segment of the Nevada Northern Railroad to be improved within White Pine and Elko Counties shall be conducted.

c. An inventory of the segments of the Pony Express Trail, the Lincoln Highway, and the Nevada Northern Railroad within the significant viewshed of the WPES, including ancillary facilities, shall be conducted using photographs and visual resource assessments prepared for the EIS. Guidance in Instruction Memoranda No. NV-2004-004 and No. NV-2004-006 relative to the Pony Express Trail will be followed.

## **B. Eligibility**

1. The BLM, in consultation with the SHPO, shall ensure that all cultural resources located within the APE of an activity area are evaluated for eligibility to the NRHP prior to the initiation of activities that may affect historic properties. Eligibility will be determined in a manner compatible with the BLM/SHPO Protocol.

2. To the extent practicable, eligibility determinations shall be based on inventory information. If the information gathered in the inventory is inadequate to determine eligibility, the BLM or WPEA (through its contractors) may need to conduct limited subsurface testing, or other evaluative techniques, to determine eligibility. Subject to approval by the BLM, in consultation with the SHPO, evaluative testing is intended to provide the minimum data necessary to define the nature, density, and distribution of materials in potential historic properties, to make final evaluations of eligibility, and to devise treatment options responsive to the information potential of the property. Should the BLM disapprove the applications for the WPES project, or should WPEA abandon the project and withdraw its applications prior to the BLM approval, then any further evaluative testing shall cease, except for completing all fieldwork and post-fieldwork activities that are ongoing as of the date of withdrawal or disapproval.

3. If any of the parties disagree regarding eligibility, the BLM shall notify all parties and seek a determination of eligibility from the SHPO. If the BLM and SHPO disagree regarding eligibility, the BLM shall seek a formal determination of eligibility from the Keeper of the National Register in accordance with 36 CFR 800.4 (dated 1986). The Keeper's determination will be considered final.

4. If an Indian tribe that attaches religious and cultural significance to a property disagrees with the BLM's findings, the tribe may ask the Advisory Council to request that the agency official obtain an official determination of eligibility from the Keeper of the National Register.

### C. Treatment

1. In avoiding or mitigating effects, the BLM, in consultation with SHPO, Indian tribes, and interested persons, shall determine the precise nature of effects to historic properties identified in the APE if the WPES project is approved by the BLM. All treatment shall be done in a manner consistent with the BLM/SHPO Protocol.

2. The BLM, to the extent practicable, and in consultation with the SHPO, shall ensure that WPEA avoids effects to historic properties through project design, or redesign, relocation of facilities, or by other means in a manner consistent with the BLM/SHPO Protocol.

3. When avoidance is not feasible, the BLM, in consultation with SHPO, Indian tribes, WPEA, and interested persons, shall develop, or ensure that WPEA develops, an appropriate treatment plan designed to lessen or mitigate project-related effects to historic properties. For properties eligible under criteria (a) through (c) (36 CFR 60.4), mitigation, other than data recovery, may be considered in the treatment plan (e.g. HABS/HAER recordation, oral history, historic markers, exhibits, interpretive brochures or publications, etc.). Where appropriate, treatment plans shall include provisions (content and number of copies) for a publication for the general public.

4. When data recovery is required as a condition of approval, the BLM, in consultation with the SHPO, shall develop, or ensure that WPEA develops, a data recovery plan that is consistent with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716-37) and *Treatment of Historic Properties: A Handbook* (Advisory Council 1980).

5. The BLM shall require as a condition of approval and implement, or ensure that WPEA implements, through its contractor, the fieldwork portions of any final treatment plan prior to initiating any activities that may affect historic properties.

6. The BLM shall ensure that all records and materials resulting from identification and treatment efforts are curated in accordance with 36 CFR 79 in BLM-approved facilities. All materials collected will be maintained in accordance with 36 CFR 79 until the final treatment report is complete and collections are curated or returned to their owners. The BLM shall encourage private owners to donate collections obtained from their lands to an appropriate curation facility.

7. The BLM shall ensure that all final reports resulting from treatment activities will be provided to the SHPO, Indian tribes, and the Advisory Council, and made available to

other interested persons. All such reports shall be consistent with contemporary professional standards and the Department of Interior's Formal Standards for Final Reports of Data Recovery Programs (42 FR 5377-79).

#### **D. Discovery Situations**

1. When previously unidentified cultural resources are discovered, all WPES-related activities within 100 meters of the discovery will cease immediately and WPEA or its authorized representative shall notify the BLM authorized officer. Prior to initiating any ground disturbing activities within the APE, WPEA will provide the parties with a list of, and schedule for, the WPEA and/or other authorized employees empowered to halt all potentially destructive activities in discovery situation and who will be responsible for notifying the BLM of any discoveries. At least one of these employees will be present during all of WPEA's activities.

- a. The BLM shall notify the SHPO, interested persons and Indian tribes and consider the SHPO's and tribe's initial comments on the discovery. Within two working days of the discovery, the BLM shall notify WPEA, the SHPO, Indian tribes, and identified interested persons of the BLM's decision to either allow undertaking-related activities to proceed or to require mitigation.
- b. If, in consultation with the SHPO, interested persons and Indian tribes, the BLM determines that mitigation is appropriate, the BLM shall solicit comments from the SHPO, Indian tribes, and interested persons, as appropriate, to develop mitigating measures. The SHPO, tribes, and other interested persons, as appropriate, will be allowed two working days to provide the BLM with comments to be considered when the BLM makes a decision on extent of mitigative efforts. The BLM will determine the mitigation required; within seven working days of the BLM's notification to WPEA of the need for mitigation, the BLM will notify the SHPO, Indian tribes, and appropriate interested persons of its decision and ensure that such mitigative actions are implemented.
- c. The BLM shall ensure that reports of mitigation efforts for discovery situations are completed in a timely manner and conform to the Department of Interior's Formal Standards for Final Reports of Data Recovery Program (42 FR 5377-79). Drafts of such reports shall be submitted to the SHPO and Indian tribes for a 30 - day review and comment as stipulated in H.2. Final reports shall be submitted to the SHPO, Indian tribes, Advisory Council, and interested persons for informational purposes.
- d. All activities in the area of the discovery will be halted until WPEA is notified in writing by the BLM that mitigation is complete and activities can resume.

## E. Other Considerations

1. The BLM shall ensure that all stipulations of this Agreement are carried out by the BLM, SHPO, WPEA, and all of its contractors or other personnel.
2. The BLM shall ensure that historic, architectural, ethnographic, and archaeological work conducted pursuant to this Agreement is carried out by, or under the direct supervision of, persons meeting qualifications set forth in the Secretary of the Interior's Professional Qualification Standards (36 CFR 61) and who have been permitted for such work on public lands, by the BLM.
3. WPEA, in cooperation with the BLM and the SHPO, shall ensure that all its personnel, and all the personnel of its contractors, are directed not to engage in the illegal collection of historic and prehistoric materials. WPEA shall cooperate with the BLM to ensure compliance with the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470) on public lands and with Nevada Revised Statutes 381 (Nevada Antiquities Law) for state and private lands.
4. WPEA shall bear the expense of identification, evaluation, and treatment of all cultural properties directly or indirectly affected by WPES project-related activity. Such costs shall include, but not be limited to, pre-field planning, field work, post-fieldwork analysis, research and report preparation, interim and summary report preparation, publications for the general public, and the cost of curating project documentation and artifact collections. It is understood that the BLM may decide not to approve the right-of-way (ROW) and land disposal applications for the WPES. Prior to any BLM decision to approve or disapprove the applications, WPEA has agreed to bear the expense of the identification and evaluation of cultural properties required as part of the cultural resources surveys necessary to obtain information for the Environmental Impact Statement. If the BLM disapproves the applications, or if WPEA abandons or withdraws its pending application for ROW and land disposal prior to a BLM decision, then WPEA shall incur no further expense for evaluation or treatment for any cultural properties except for completing existing or already authorized work (fieldwork and post-fieldwork activities) that is ongoing as of the date of withdrawal or disapproval.
5. Identification, evaluation, and treatment efforts may extend beyond the geographic limits of the ROW when the resources being considered extend beyond the ROW. No identification, evaluation, or treatment efforts will occur beyond that necessary to gather data for the completion of the Section 106 process as agreed, prior to the BLM's decision to approve or disapprove the submitted applications.
6. Traditional Cultural Properties (TCPs) will be identified, evaluated, and treated through consultation with appropriate Indian tribes. WPEA can contract for data gathering to assist the BLM in identifying, evaluating and treating TCPs. However, formal consultation, as needed, will be done by the BLM. TCP identification, evaluation

and treatment efforts shall be consistent with BLM Manual 8160 and its associated handbook.

7. Information on the location and nature of all cultural resources, and all information considered to be proprietary by tribes, will be held confidential to the extent provided by the NHPA, the Native American Graves Protection and Repatriation Act (NAGPRA), Archaeological Resources Protection Act (ARPA) and other applicable Federal laws

8. The BLM shall ensure that any human remains, grave goods, items of cultural patrimony, and sacred objects, encountered during the undertaking are treated with the respect due such materials. In coordination with this Agreement, human remains and associated grave goods found on public land will be handled according to the provisions of NAGPRA and its implementing regulations (43 CFR 10). Human remains and associated grave goods found on state or private land will be handled according to the provisions of Nevada statute NRS 383.

#### **F. Monitoring**

1. The BLM and the SHPO may monitor actions carried out pursuant to this Agreement.
2. Any areas that the BLM, in consultation with the SHPO, identifies as sensitive will be monitored by an appropriate professional cultural resource specialist or tribal representative during any activities that may impact the area. Treatment Plans will contain monitoring plans as needed. Monitors shall be empowered to stop work to protect resources. Work cannot proceed without monitors in place (including Native American monitors as appropriate).

#### **G. Notices to Proceed**

If the BLM decides to approve the submitted applications, the ROWs issued under these applications shall provide for the issuance of Notices to Proceed. Notices to Proceed (NTP) may be issued by the BLM to WPEA for individual construction activities as defined by WPEA in its Construction Plan under any of the following conditions:

1. The BLM and SHPO have determined that there are no cultural resources within the APE for the construction segment;
2. BLM and SHPO have determined that there are no historic properties within the APE for the construction segment; or
3. BLM, after consultation with the SHPO, Indian tribes, and interested persons, has implemented an adequate treatment plan for the construction segment, and
  - (a) fieldwork phase of the treatment option has been completed;

- (b) BLM has accepted a summary description of the fieldwork performed and a reporting schedule for that work; and
- (c) WPEA has posted a surety as stipulated in Section I. below for post-fieldwork costs of the treatment plan.

## **H. Time Frames**

1. Reports: The BLM shall review and comment on any report submitted by WPEA within 30 calendar days of receipt.
2. Consultation with Interested Parties and Indian tribes: Prior to SHPO consultation, the BLM shall submit the results of all identification and evaluation efforts and treatment plans to identified Indian tribes and interested persons for a 30-day review and comment period. Consultation for discovery situations shall be handled in accordance with Section D.
3. SHPO Consultation: The BLM shall submit the results of all identification and evaluation efforts and treatment plans to the SHPO for a 30-day review and comment period. Consultation for discovery situations shall be handled in accordance with Section D.
4. If any party to the agreement, Indian tribe, or other interested person fails to respond to the BLM within 30 days of the receipt of a submission, the BLM shall presume concurrence with the BLM's findings and recommendations as detailed in the submission and proceed accordingly.
5. Reports: A draft final report of all identification, evaluation, treatment or other mitigative activities will be due to the BLM within nine (9) months after the completion of the fieldwork associated with the activity, unless otherwise negotiated.
6. Curation: All records, photographs, maps, field notes, artifacts, and other materials collected or developed for any identification, evaluation, or treatment activities will be curated in a facility approved by the BLM at the time the final report associated with that activity is accepted by the BLM, unless materials and artifacts must be returned to the owner.

## **I. Surety Bonds**

1. The terms of any ROW issued by the BLM for the WPES shall provide for the posting of sureties for the protection of cultural properties, as set forth below. WPEA will post a surety with the BLM in an amount sufficient to cover all post-fieldwork costs associated with implementing a treatment plan or other mitigative activities, as negotiated by WPEA when they contract for services in support of this Agreement. Such costs may include, but are not limited to post-field analyses, research and report preparation, interim and

summary reports preparation, and the curation of project documentation and artifact collections in a BLM-approved curation facility. The surety shall be posted prior to the BLM issuing any Notice to Proceed.

2. The surety posted as provided in Section I (1) above shall be subject to forfeiture if the post-fieldwork tasks are not completed within the time period established by the treatment option selected; provided, however, that the BLM and WPEA may agree to extend any such time periods. The BLM shall notify WPEA that the surety is subject to forfeiture and shall allow WPEA 15 days to respond before action is taken to forfeit the surety.

3. The surety shall be released, in whole or in part, as specific post-fieldwork tasks are completed and accepted by the BLM.

#### **J. Dispute Resolution**

1. If any party to this agreement, or an interested person, objects to any activities proposed pursuant to the terms of this agreement, the BLM shall consult with the objecting party and the SHPO to resolve the issue. The BLM Nevada State Office will have the authority to make a final determination for any objection that cannot be resolved by local consultation.

2. The Parties may continue all actions under this Agreement that are not the subject of the dispute.

#### **K. Amendment**

Any party to this Agreement may request that this Agreement be amended, whereupon the Parties will consult to consider such amendment.

#### **L. Termination**

Any party to this Agreement may terminate the Agreement by providing thirty (30) days notice to the other Parties, provided that the Parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination.

#### **M. Execution**

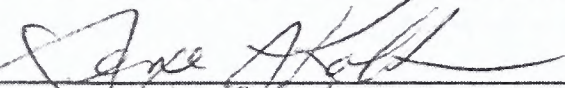
1. Execution and implementation of this Agreement evidences that the Parties have satisfied their Section 106 responsibilities for all actions associated with the construction and installation of the WPES.

2. In the event that the Parties do not carry out the requirements of this Agreement or it is terminated, the BLM will comply with the provisions of the BLM/SHPO Protocol.

3. This Agreement shall become effective on the date of the last signature below, and shall remain in effect until terminated as provided in Stipulation L, or until undertaking is completed, or a maximum of five years from the effective date.

**CONSULTING PARTIES:**

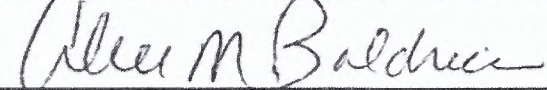
**BUREAU OF LAND MANAGEMENT, ELY DISTRICT, NEVADA**

By: 

Date: 3/2/06

Title: Field Manager

**NEVADA STATE HISTORIC PRESERVATION OFFICE**

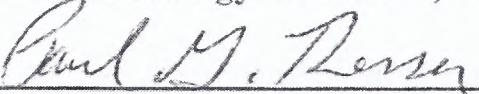
By: 

Date: 4/25/06

Title: Deputy SHPO

**CONCURRING PARTY:**

**White Pine Energy Associates, LLC**

By: 

Date: 3/9/06

Title: Exec. V.P.

## **APPENDIX A: CONSTRUCTION SEGMENTS**

### **Construction Segments**

Construction segments for the WPES for the purposes of issuing Notices to Proceed are defined as follows:

The following construction segments are associated with the water system (including water pipe, wells, and associated access roads and electric distribution lines).

Segment A1 – Water system from power plant site to farthest outlying well.

Segment A2 – Electric distribution line from Gonder substation to Segment A1 (if required).

The following construction segments are associated with the power plant site, electric system, and associated project access facilities.

Segment B1 – Power plant site and new access road.

Segment B2 – New rail spur between Nevada Northern Railroad and power plant site.

Segment C1 – Duck Creek Substation and new access road.

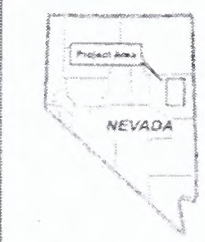
Segment C2 – Thirtymile Substation and new access road.

Segment C3- Electric transmission between Duck Creek and Thirtymile substations, including associated access roads and laydown/staging areas.

Segment C4 – Electric connection (looping) between Falcon-Gonder transmission line and Thirtymile Substation.



**Figure 1 - Proposed Action  
White Pine Energy Station**



- Project Features**
- Existing Substation
  - Existing Transmission Line
- Direct APE Features-Proposed Action**
- Proposed Well Site
  - Proposed Water Pipeline
  - Proposed Rail Spur
  - Proposed Access Road
  - Proposed Substation Site
  - Proposed Power Plant Site
  - Proposed Electric Transmission Line(s)

- Land Status**
- Bureau of Land Management
  - Forest Service
  - Private
- Surface Water**
- Perennial Stream or River
  - Intermittent Stream or River
  - Wetland

Scale: 0 1.5 3 Miles  
 1:115,000 when printed at 22 x 34 inches

*Note: Figure does not show all ancillary facilities*

**Appendix G**  
**Cultural Resources Background Information**



# Cultural Resources Background Information

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This appendix contains cultural resources background information on regulatory setting, criteria for significance, and the natural and cultural settings in the affected environment of the proposed WPES Project. Information in this appendix supports discussions contained in *Section 3.13, Cultural Resources* in Chapter 3 of this EIS.

## Regulatory Setting

Historical and archaeological resources are managed under an intricate system of federal laws, some of which have resulted in comprehensive plans or management strategies. Those that pertain specifically to historic and archaeological resources and the WPES Project are briefly summarized in the following text.

### Historic Sites Act of 1935 (16 USC 461-467)

The Historic Sites Act established a national policy to preserve for public use historic sites, buildings, and objects of national significance for the inspiration and benefit of the people of the United States, and led to the implementation of the Historic American Building Survey (HABS) and the Historic American Engineering Record (HAER) by the Secretary of the Interior and the National Park Service. This Act also created a National Park System Advisory Board, which in part was responsible for making recommendations on the designation of national historic landmarks.

### National Environmental Policy Act (NEPA) of 1969 (42 USC 4321 et seq.)

The NEPA declared, in part, that it is the policy of the federal government to preserve important historic, cultural and natural aspects of the nation's heritage, and requires federal agencies to prepare environmental impact statements prior to making decisions about projects that may significantly affect the quality of the human environment. The Council on Environmental Quality is responsible for issuing guidelines for the implementation of this broad act.

### Executive Order 11593, Cultural Resources

On May 31, 1971, the President of the United States issued an Executive Order directing all federal agencies to locate and inventory all cultural resources under their jurisdiction to ensure that actions do not inadvertently affect significant cultural resources. This Order further directed agencies to consider the effects of actions authorized by federal permits or licenses on resources located on non-federal lands.

### American Indian Religious Freedom Act of 1978 (PL 95-341)

The American Indian Religious Freedom Act established federal policy to protect and preserve the inherent rights of freedom for native groups to believe, express, and exercise their traditional religions. These rights included, but are not limited to, access to sites, use

and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.

### **Executive Order 13007, Indian Sacred Sites**

On March 24, 1996, the President of the United States issued an Executive Order mandating that in managing federal lands, each executive branch agency with statutory or administrative responsibility for the management of federal lands shall, to the extent practicable permitted by law, and not clearly inconsistent with essential public functions, (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies are required to maintain the confidentiality of sacred sites.

### **National Historic Preservation Act (NHPA) of 1966 (16 USC 470 et seq.)**

The NHPA established the Advisory Council on Historic Preservation (ACHP); authorized the Secretary of the Interior to maintain a NRHP; directed the Secretary to approve state historic preservation programs that provided for a SHPO; established a National Historic Preservation Fund program; and codified the National Historic Landmarks program.

Section 106 of the NHPA requires that federal agencies take into account the effects of their actions on properties that may be eligible for or listed on the NRHP, and afford the ACHP a reasonable opportunity to comment. To determine if an undertaking could affect NRHP-eligible properties, all cultural sites (including archaeological, historical, and architectural properties) that could be impacted by the undertaking must be inventoried and evaluated for inclusion in the NRHP.

The Section 106 review process (36 CFR 800) is implemented using a five-step procedure: 1) the responsible federal agency (which is the BLM) or the designated federal representative (as authorized by the BLM, may be the Licensee) initiates the Section 106 process through contact with the appropriate SHPO, establishes the APE, identifies other consulting and interested parties, and begins public involvement; 2) identification and evaluation of historic properties within the APE; 3) assessment of the effects of the undertaking on properties that are eligible for the NRHP; 4) consultation with the SHPO, concerned parties, and other agencies to resolve adverse effects and the development of an Agreement Document (Memorandum of Agreement or Programmatic Agreement) that addresses the treatment of historic properties, if appropriate; and 5) implementation according to the conditions of the Agreement Document. The Section 106 compliance process need not consist of all the steps above, depending on the situation. For example, if identification and evaluation result in the documented conclusion that no properties included in, or eligible for inclusion in, the NRHP are present within the APE, the process ends with the identification and evaluation step.

### **Criteria for Significance**

Decisions regarding the management of cultural sites hinge on determinations of their NRHP significance. To determine significance, the National Park Service has identified components that must be considered in the evaluation process. These include criteria for determining eligibility, historic context, and integrity.

Significance of cultural resources is measured against the following NRHP criteria for evaluation (36 CFR 60.4):

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and,

- (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) that are associated with the lives of persons significant in our past; or
- (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) that has yielded, or may be likely to yield, information important in prehistory or history.

## **Period of Significance**

The concept of a period of significance as used in the evaluation process establishes the timeframe in which a property was associated with important events, activities, or persons; or the period in history when it attained the characteristics that qualify it for NRHP eligibility. Period of significance usually begins with the date events began giving the property its historic significance or the date of construction. Periods of significance may be as brief as a single year or they may span several years, and consist of beginning and close dates (National Register Bulletin 16A 1997).

## **Application of the NRHP Criteria to Historic-era Properties**

While historic-era properties may be found eligible to the NRHP under any of the above criteria, some criteria are more commonly relevant than others. Often, historic-era properties are found eligible under Criterion A, for a significant association with a historic event, or under Criterion C, for displaying distinctive examples of a particular architectural style. Potential significance is evaluated in direct relation to the contextual themes identified as being relevant to a particular region. A detailed description of the criteria and their application follows.

### **Criterion A**

For a historic-era property to be eligible under Criterion A, it must be found to be associated with specific important events (for example, primary exporter of cattle in the state) or important patterns of events (for example, development of irrigated farming or transportation). A building or property must not only be associated with a historic event, but also be adequately documented through an accepted means of research; speculative associations alone cannot confer eligibility. The significance of the documented association must then be demonstrable. In other words, the property's association with the important event must also be an important association in and of itself, not mere coexistence.

## **Criterion B**

For eligibility under Criterion B, a property must be associated with an important individual's productive life, and must be a property that is closely associated with that person. For instance, a property that was once owned or established by a prominent citizen, but was not their primary place of employment or habitation, or had no other known associations to the person, would not likely be found eligible under Criterion B.

Determining associations with people considered important in local history would require a careful assessment of whether the property under investigation is the property that best represents that association.

## **Criterion C**

Significance under Criterion C usually stems from the ability of the property, or one of more of its buildings, constructed facilities or structures, to illustrate a subtype associated with the historic context and the period of significance. Just as importantly, the property should retain enough integrity to convey that association. Generally under this Criterion, a property will appear eligible because it is comprised of constructed features that exhibit especially fine style, craftsmanship, construction methods, or is a good representative of a relatively rare architectural or engineering style for the period.

## **Criterion D**

Eligibility under Criterion D hinges on the ability of the property, as contained in artifacts and objects, to further address issues of scientific importance to the period of significance. These data are primarily derived from archaeological deposits, and rarely buildings and structures themselves. Archaeological features or deposits may provide new information not available elsewhere regarding kinds of documented or undocumented activities. While constructed elements can sometimes provide important information regarding historic construction techniques, most of these techniques are well documented in both written and visual sources, and generally, would not yield new primary information.

## **Historic Landscape Considerations**

Research into historic landscape issues was guided by National Register Bulletin 30, Guidelines for Evaluating and Documenting Rural Historic Landscapes (National Park Service, 1999), the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes (1992), and the NRHP eligibility criteria. These guidelines and regulations, along with the developed eligibility considerations outlined below, provided a framework with which to conduct a preliminary assessment of the potential significance of the subject properties as historic vernacular landscapes. The evaluation of such landscapes should include the assessment of whether the property:

- Played an important role in the region's economic development during the period of significance;
- Is a rare example of a property type or the oldest example of its kind in the area;
- Is a good representation of a property within a particular historic theme;

- Comprises features that indicate unique innovations or adaptations in a specific area development;
- Retains the characteristics of a property, within the period of significance.

## **District Considerations**

A district derives its importance from being a unified entity resulting from the shared interrelationship of its resources or elements (National Register Bulletin 15). A district must be a definable geographic area that can be distinguished from surrounding properties by changes in scale, age, type and style; or by documented differences in the historic development of the district from surrounding properties. It is seldom, however, defined by the limits of current parcel ownership, or by planning boundaries. The boundaries of a historic district must be based upon a shared relationship among the properties constituting the district

## **Integrity**

Generally, integrity refers to the general character and feeling of the site and the degree to which it currently resembles its condition and setting during its period of significance. Historic integrity is composed of seven qualities: location, design, setting, materials, workmanship, feeling, and association (National Park Service, 1999). Assessment of the property in relation to these seven aspects requires an appraisal of whether subsequent changes in the property contribute to its historic evolution or alter its historic integrity from that of the period of significance.

Because of the importance of land, natural features, and vegetation, the seven qualities of integrity are applied differently to rural landscapes. This relationship involving patterns of spatial organization, circulation networks, and clusters is directly related to design and is strongly influenced by the cohesiveness of the rural landscape. Integrity of setting and design is composed of boundary demarcations, small-scale elements, vegetation, evidence of responses to the natural environment, continuing or compatible land uses, and activities that enhance integrity of feeling and association. Associated archaeological deposits may enhance the integrity if they provide evidence of activities no longer practiced.

## **Assessing Overall Integrity**

Generally, integrity is based on the condition of the overall property and its ability to convey significance. In assessing the overall integrity, it is necessary to consider the nature, extent, and impact of changes since the period of significance. Integrity also depends on the area's historic context. A property that retains elements such as field patterns and boundary makers that are not present at other properties in the vicinity may be deemed significant, despite the deterioration and loss of other constituents. Similarly, the loss of a few features usually does not affect the overall integrity of a resource, but the repeated loss of buildings and small-scale features may result in the cumulative loss of integrity. The greatest loss of historic integrity results from new construction, and incompatible land uses covering extensive acreage.

For archaeological sites, the remains of prehistoric or historic-era activities must be in the original location in which they were deposited, and must retain sufficient association either

with an historic event or prehistoric activity that they possess data that can address research issues of regional importance.

## **Assessing Contributing And Noncontributing Resources**

Buildings, structures, objects, and sites are classified as contributing or noncontributing based on their historic integrity and association with a period and area of significance. Those resources not present during the historic period, not part of the property's documented significance, or no longer reflecting their historic character are noncontributing.

## **Prehistoric Archaeological Resources**

Prehistoric archaeological resources consist of any material remains of human life or activities (for example, sites, features, or objects) that can provide an understanding of past human behavior (16 U.S.C. Section 470 pp.). Prehistoric sites within the project area could be considered significant and determined eligible for the NRHP if they possess integrity and have a reasonable amount of research potential, that is possess data that have the ability to address the following research issues established for the project:

- Geomorphology and chronology, which in part depend on the site's potential to yield data relevant to regional stratigraphic sequences, absolute dates, or to contribute to relative chronologies by virtue of stratigraphic relationships.
- Paleoenvironmental reconstruction and the ability of resources to contribute evidence directly relevant to reconstructing past environments.
- Environmental change and the presence of information relevant to the study of cultural responses to such change.
- Data contained in ground and flaked stone assemblages and its ability to contribute to our understanding of past techno-environmental and sociocultural systems.
- Information that provides insight into settlement patterns, population density, group size, group structure, and mobility.
- Data that may be used to further an understanding of exchange networks that existed between groups.
- Artifact assemblages associated with specific linguistic groups that may be used to infer migration and population patterns by these groups.

## **Traditional Cultural Properties**

Sites that can yield information about their role in the traditional and cultural activities of living people and their ancestors are potentially eligible for the National Register as Traditional Cultural Properties (TCPs). Their presence in the project area triggers the need for additional Native American consultation prior to the completion of environmental studies and before any mitigation of adverse effect by data collection is undertaken.

## Natural Setting

The proposed WPES Project is located in eastern Nevada, a region that is within the physiographic Great Basin as defined by Hunt (1967) and the floristic Great Basin outlined by Cronquist et al. (1972). North-south trending mountain ranges and intervening valleys characterize this portion of the Great Basin. Proposed and alternative power station locations and accompanying substations, access roads, railroad spur lines, and water pipelines and wells are located within Steptoe Valley, which is drained by the north flowing Duck Creek that empties into Goshute Lake. First, Second, and Third Creeks, Fitzhugh Creek, Big Indian Creek, and several smaller unnamed drainages also flow into Steptoe Valley from the Schell Creek Range. Goshute Creek and Cherry Creek form the major drainages from the Egan and Cherry Creek Ranges.

The proposed Thirtymile Substation near Robinson Summit is located at the interface between the Egan Range to the south and Butte Mountains to the north. The area is within the watershed of an unnamed northwest flowing drainage that empties into the northern end of Jakes Valley.

Steptoe Valley is bordered by the Schell Creek Range to the east and the Egan Range to the west. The western flank of the Schell Creek Range, bordering Steptoe Valley, consists primarily of older volcanic rocks comprised of rhyodacite, quartz, andesite, air-fall tuff, and related sedimentary rocks and welded tuff, whereas, the Egan Range is much more complex. The range is primarily composed of layers of shale, limestone, and dolomite with intrusive monzonite and quartz monzonite south and north of Monte Neva Hot Springs. Older volcanics similar to those of the Schell Creek Range also occur north and south of U.S. 50 within and in the vicinity of the proposed substation near Robinson Summit. Monte Neva Hot Springs as well as numerous unnamed springs are located along the west side of Steptoe Valley.

Project areas range in elevation from 5,488 feet above mean sea level (amsl) at the northern end of the project area to approximately 6,200 feet amsl at the southern end of Steptoe Valley. The proposed Thirtymile Substation is situated in the Egan Range on westerly facing slopes with elevations ranging from approximately 6,880 to 7,040 feet.

Varied vegetation can be found within Steptoe Valley. Mid-elevation alluvial fan slopes contain vegetation that is dominated by small sagebrush (*Artemisia arbuscula*). Big sagebrush (*Artemisia tridentata*), Great Basin wild rye (*Leymus cinereus*), green rabbitbrush (*Chrysothamnus viscidiflorus*), Indian ricegrass (*Achnatherum hymenoides*), and greasewood (*Sarcobatus vermiculatus*) form the dominant species at the distal end of the fans, with Baltic rush (*Juncus balticus*) located at the bottom of the fans in alkaline soil environments. Near Robinson Summit, within the Pinyon-Juniper woodlands, vegetation is dominated by pinyon pine (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*).

## Cultural Setting

The WPES project area and its vicinity are known to contain numerous traces of past human activity ranging from early Native American sites and artifacts, to the remains of early trails and transportation routes, historic-era mining, and ranching activities. Such materials can be

found at many locations on the landscape and represent the traces of human activities that in some cases extend as far back as 10,000-12,000 years before the present (BP).

## Prehistoric Setting

Although earlier archaeological manifestations pre-dating classic Paleo-Indian occupation of the Great Basin may have been identified (James and Zeier, 1982; Lyneis, 1982), such sites are controversial as to their dating and cultural associations, and none have been identified in or near Steptoe Valley. Paleo-Indian (or "Pre-Archaic") sites dating to as early as 11,000 BP are known from eastern Nevada such as those documented at the Ely Airport (BLM Report CRR 8111 [NV 040] 2005-1512), Sunshine Well (Jones et al., 1996) and Giroux Wash (Stoner et al. 2000b). One of the main characteristics distinguishing Paleo Period sites from other prehistoric cultural manifestations is the presence of fluted implements such as Clovis, Folsom, and Plano projectile point forms, crescent shaped implements, choppers, graters, punches, and an assemblage of steep-edged scrapers, which are primarily unifacial.

Shifting land use patterns, subsistence systems, and the emergence of a wide variety of implement types mark the beginning of the Archaic Period or, in eastern Nevada, the Wendover/Early Archaic Period around 9,500 BP (Aikens and Madsen, 1986; Bryan, 1979; Elston et al., 1979; Jennings, 1986; Jones et al., 1996). Site locations from the earlier years of the Archaic suggest continued adaptations to lake shore environments as those seen in the Paleo Period (Jones, et al. 1996; Madsen, 1982, Stoner et al., 2000a) although there appears to have been an increase in the variety of implements and in the types of materials utilized. Projectile point styles consist of Stemmed, Pinto, and Lake Mojave types. However, unlike during the preceding Paleo Period, Archaic peoples seem to have inhabited a much more diverse landscape including not only valley floors and lake margins but cave sites and upland areas as well.

Further shifts in land use, subsistence, and technological systems occurred around 6,000 BP at the beginning of the Black Rock Period, possibly in partial response to a gradual and long-term decrease in yearly rainfall. During this time not only was there an increase in the number of occupation and activity sites scattered across the landscape, but these sites also indicate an increased utilization of upland zones and their associated floral and faunal resources. As during the earlier portion of the Archaic, remains of larger game tend to be found in archaeological contexts. Large side-notched Elko and Gatecliff point forms slowly replace the early Pinto and stemmed point forms.

Near the end of the Black Rock Period, Rose Spring and Eastgate series projectile points appear in archaeological sites (Stoner et al. 2000a), and represent introduction of bow and arrow technology. Other phases from the Middle Archaic, such as the South Fork Phase (Elston, 1986) begin to show evidence of increased populations, more diverse subsistence and technological patterns, and the first evidence of artistic expression in the form of ornaments and rock art (Elston, 1986; Heizer and Baumhoff, 1962; Thomas, 1983; Schaafsman, 1986). Sites tend to be larger and more numerous than in earlier periods. Milling equipment reflects the increased subsistence diversity and exploitation of various seeds such as those derived from the pinyon pine (Fowler, 1968; Thomas, 1983), and may be related to fairly dry conditions (Madsen, 1982).

A shift from the Middle and Late Archaic patterns is seen in the emergence of the Fremont “cultures”, Fremont/Parowan Period around 1600 BP, described by Marwitt (1986). The appearance of pottery sherds, traces of maize, and a well-developed pinyon gathering and processing technology indicate a dramatic shift from the gathering and hunting economy of the Archaic to a mixed economy including horticulture, providing for sedentary farmsteads and small villages (Marwitt, 1986).

Small villages, ceramics, and some reliance on horticulture characterized the Parowan Fremont culture. Although sharing similarities in design elements and methods of construction with the Anasazi vessels, ceramics of the Fremont differ in the types of temper and vessel form. Near the project area they have been found at the Mariah Site (26LN618) (Brooks et al., 1977) and at Panaca Summit (Elston and Juell, 1987). As rainfall, necessary for agriculture, became more unpredictable the Fremont appear to have abandoned agriculture in favor of a hunting-gathering adaptive strategy in the pinyon-juniper woodlands of western Utah and eastern Nevada, with a terminal date of around 650 BP (Wilde and Soper, 1999).

The arrival of *Neue*, Numic speakers and ancestral Shoshoni, in the area is marked by the presence of brown ware ceramics, twined and coiled basketry, and small side-notched projectile points. While the timing of their arrival and the area from which they moved is widely debated (see Madsen and Rhode, 1994), current evidence suggests that it may be around 1,000 B.P.

## **Ethnographic Background**

Ethnographically, the project area was inhabited by the Western Shoshone. The following provides a brief summary of the ethnographic information. A more detailed overview can be found in James (1981:160-210) and Bengston (2003).

### **Settlement and Subsistence**

The Western Shoshone lived in seasonal semi-nomadic groups that came together during the winter months. Often these camps were located near pinyon caches (Fowler and Liljeblad, 1986). Two ethnographic village locales appear to be located near Ely, on Duck Creek about 8 miles northwest of McGill, at Warm Springs (possible Monte Neva Hot Springs) along the west side of Steptoe Valley, Schellbourne, Egan Canyon, and at Cherry Creek (Bengston, 2003; Steward, 1938:121 and Figure 9)

Because of the presence of diverse ecological zones, subsistence involved the exploitation of various faunal and plant resources. Information on subsistence activities within Steptoe Valley primarily comes from Ely, where pine nuts were gathered in the Egan Range and across the valley in the Schell Creek Range, where they were cached for the winter. Rabbit drives were held immediately following the pine nut harvest (Steward, 1938:123).

A consultant of Steward indicated that prior to the arrival of Europeans, horticulture was introduced by peoples from the south. While limited in production it involved the propagation of corn, large blue pumpkins, and large white beans (Steward, 1938:122). The people of Egan Canyon, a natural travelway between Steptoe Valley and Butte Valley, were linked with peoples in both regions (Steward, 1938:146), and apparently obtained subsistence resources from both regions. For antelope drives they traveled west to Butte

Valley or south to Steptoe Valley (1938:147). Those from Ely went to Spring Valley near Cleveland for antelope drives and to Spring Valley and Snake Valley for rabbit drives, and also to northern Steptoe Valley near Cherry Creek (1938:122). Festivals involving dancing and gambling were conducted after the pine nut harvest, and involved local affairs followed by larger events held on Duck Creek in Steptoe Valley, at Ely, Cherry Creek, Cleveland, Baker, and White River Valley (1938:122-123).

### **Political Organization**

Western Shoshone families usually belonged to small, local geographic districts within the general expanse of Western Shoshone territory and were usually centered within a single valley or cluster of winter villages. These units tended to be stable, within areas with predictable resource availability, but were subject to change in more marginal environments. This organization led Steward to conclude that the political organization was a direct function of social and economic conditions (Steward, 1937), with regional groups named after prominent resources. For example, the people of Steptoe Valley were referred to as *Pa'anaihteen*, or "The people from up above" (Steward, 1938:121). Fowler indicated that such labels were not socio-political, but that the primary significance was as a signal to outsiders that people living in the 'rye-grass eater' area had that commodity to share. Therefore, it served as more of an economic function. (Fowler, 1980 in James, 1981:200). Headmen were generally restricted to periods of communal activity (Thomas et al., 1986:276).

Individual property was owned, however resources were considered to be communal property and ownership did not transfer to the individual until the resource was transformed into something of use. For example, sources of basketry material were not owned, but once harvested and formed into a basket the basket was then owned by the individual.

### **Ideology**

Other than a belief in animism as it relates to nature and the sun, no formal system of supernatural beliefs existed. Most important were the presence of power, a major part of Shamanism, and the art of healing (James, 1981:205). Shamen had the ability to cure specific ailments, use their powers for their own benefit, or had general curing abilities (Steward, 1941:257).

Round dances generally held throughout the Great Basin in the past or presently include the two (1869 and 1889) Ghost Dances, the Bear Dance, and the Sun Dance, the latter of which is important to the Western Shoshone. The dance originated in the Plains, around 1700, spreading to the Plateau region and then to the Wind River Shoshone around 1800, and from there to the Western Shoshone in Nevada (Shimkin, 1953:472). While varying from the Plains event, similarities were fasting by the dancers with the general objective being the promotion of health and the public good. Unlike the original, the dance also promoted the healing process (Shimkin, 1953; Jorgenson, 1986).

### **Ceremonial and Historic Sites**

Several areas within the vicinity of the proposed project were known to have ceremonial significance. Hot springs north of Ely (possibly referring to Monte Neva Hot Springs, among

others) were used for ritual purposes (Facilitators, 1980:3.19 in Bengston, 2003:119). Steptoe Mountain, the location of which is unknown, is associated with the Shoshone story about *Watoavic*, also referred to as *Si-ets*, a man made of stone who killed a number of Western Shoshone children (A. Smith, 1993:165 in Bengston, 2003:98). Two areas are of historic significance based upon events that occurred in the past. Both are known as massacre sites where the U.S. Cavalry destroyed villages located east and north of Ely in the 1860s. The exact locations of these villages, however, are not presently known (Facilitators, 1980:3.18 and 3.19 in Bengston, 2003:106).

## Historic Background and Setting

Marking the beginnings of the historic era in the White Pine County region is largely based on rather arbitrary temporal and cultural markers. Although contact between European and American traders and trappers and the ethnographic Shoshone had likely been taking place since the early decades of the 19<sup>th</sup> century at the very least, sustained contact between Native and Euro-American populations did not occur until the 1850s and 1860s (Bailey, 1966; James, 1981; Patterson et al., 1969). One of the first expeditions was in 1853, and was organized by Lieutenant Colonel E. J. Steptoe, who sent a detachment into Nevada led by John Reese to search for a possible route for the troops that were wintering in Salt Lake City (Patterson et al., 1969:86-87; Morgan, 1943:224-227 in Vlasich, 1981:216). During the winter of 1859 another expedition was led by Captain James H. Simpson. A part of this mission Howard Egan, a Mormon scout, explored possible routes for Chorpenning's California Mail Company (Morgan, 1943:233; and Mordy and McCaughey, 1968:226 in Vlasich, 1981:216). During this time, the influence of the U.S. Government in particular became increasingly felt among the Shoshone and within a short period of time in the 1850s, their traditional lifeways and subsistence patterns were largely ended. Informal settlements had been established near American ranches, mines, and other areas of economic and industrial activity (Malouf and Findlay, 1986).

As the population of Euro-American settlers and entrepreneurs increased in the White Pine County region, particularly following the Ruby Valley Treaty, several predominant economic patterns and general themes of historical development emerged during the middle of the 19<sup>th</sup> century. Those themes of particular relevance to the White Pine County area include mining, ranching and agriculture, and transportation and communication.

## Mining

The economic and social development of eastern Nevada during the 19<sup>th</sup> century is more associated with the emergence of the mining industry than any other economic activity. In fact, the existence of Nevada as an independent state is due primarily to the wealth of the Comstock Lode, which helped convince the U.S. Congress and President Lincoln to create this new territory from the western section of Utah in 1861. Desperately needing additional sources of revenue for the Union cause during the Civil War, Lincoln saw to it that Nevada was declared a U.S. state in 1864 (Hulse, 1972). Following the Civil War and throughout the latter decades of the 19<sup>th</sup> century, mining continued to be the single most important economic endeavor throughout the state, although the boom and bust cycles intrinsic to the industry kept the population of much of Nevada at a very low level until the early 20<sup>th</sup> century.

Mining in White Pine County, was organized into districts in 1869. Mining began as early as 1859 with the discovery of silver ore on the south side of Pleasant Valley in what became known as the Eagle District, but was also known as the Pleasant Valley, Kern, Regan, Red Hills, and Tungstania Districts (Smith, 1976:82). The mineral wealth of this district included silver, gold, and copper; some of the early claims went to employees of the Overland Mail Company who apparently found some deposits during the course of their duties on the Pony Express route (White 1871:81 in Smith, 1976:82; Lincoln, 1923; Hill, 1916). Other early mining districts in the county included the Cherry Creek District (also known as Gold Canyon and Egan Canyon District); operations were supported by a 20-stamp mill located near the Egan Canyon Pony Express Station (Hill, 1916; Schrader, 1931; Smith, 1976).

While districts such as Cherry Creek and Gold Canyon (combined with Cherry Creek in 1872) were the scenes of extensive and initially exciting activity, they quickly faded. Lesser known and far less profitable mining districts closer to the proposed WPES Project are the Nevada District in the western foothills of the Schell Creek Range, near the southern end of Steptoe Valley; the Granite (Steptoe) District covering the east slope of the Egan Range from Water Canyon south to Steptoe; the Duck Creek District, which includes all of the Duck Creek Range and the south end of the west slope of the Schell Creek Range; the Cleve Creek District in the central part of the Schell Creek Range; the Taylor District on the west slope of the Schell Creek Range from the Summit to Steptoe Valley; and the Telegraph District, which includes both slopes of the Egan Range and all of Telegraph Canyon, which was named for the first transcontinental telegraph line (Smith, 1976:36-50). Of indirect importance to the project was the Robinson District, west of Ely, which is discussed in greater detail below. Mining continues today throughout the region and while it is still an important contributor to the financial and social well being of the area, it no longer constitutes the economic foundation of White Pine and surrounding counties.

## **Ranching and Agriculture**

The mineral strikes in Nevada after 1859 were the impetus for significant agricultural and livestock development in the state. As mining flourished, it required support systems to feed its burgeoning population. As the mining activity lulled, or rich areas were depleted, ranching and agriculture continued for those desiring to settle in the area (James, 1981).

The earliest known organized farming in Nevada occurred when John Reese and his party from Salt Lake City arrived in the Carson Valley in June of 1851 and planted barley, corn, turnips, and watermelons, which they sold to emigrants on the way to California (Elliott, 1987). However, the first cattle to enter the region accompanied the Joseph Walker party on his return trip to Salt Lake in 1834 (Elliott, 1987). Subsequent emigrant parties brought livestock through Nevada as well, and often sold exhausted animals to settlers along the way (James, 1981).

Although irrigated agriculture was in its infancy around this time, the demand for fresh fruits and vegetables induced some farmers to plant row crops and orchards. In the Steptoe, Spring, and Snake Valleys of White Pine County, earthen ditches were used to divert water from streams and springs, making irrigated agriculture possible. With only one percent of its land being irrigated by the late 19th century, however, Nevada was not generally known for its produce, but rather for its grazing land and stock feed (True, 1913; Elliott, 1987, Southern Pacific, undated).

Similar to mining, cattle grazing in White Pine County has also followed boom and bust cycles. In 1874, the first full year branding and registration of cattle was required, over 100,000 head were recorded in this region; by the early 1880s, as mining activities began to "bust", just over 32,000 head were registered. These numbers fluctuated considerably, but by 1902 mining activities once again increased and so did the cattle, with 150,000 being registered in the area (James, 1981). Those numbers would decrease over the next few years. The demand for agricultural products, in general, would fluctuate statewide throughout the 1910s, however demand was again revitalized during the course of World War I (Elliott, 1987; James, 1981).

Agricultural activity was more or less stable throughout the ensuing decade, but underwent economic hardship during the Depression of the 1930s. With various ranches and farms statewide requiring federal aid, farmers and stockmen suffered extreme hardship from 1930 until the start of World War II (Elliott, 1987).

Nevada agricultural production since the late 1940s has generally increased in spite of occasional setbacks. Livestock have continued to make up the largest share of total agricultural output. Sheep production has never completely recovered from the decline of the 1930s. Before the Depression, there were over one million sheep in Nevada. During the 1930s, that number decreased to half that amount. By the 1980s, sheep numbered a little more than 100,000 throughout Nevada (James, 1981; Elliott, 1987).

### **Early Transportation and Communication**

As with virtually every other economic endeavor in Nevada, industries dealing with transportation and communication activities were established, at least initially, in reaction to the booming mining industry in the mid-1800s. Emigrant and shipping routes were established early on for settlers and California-bound gold miners but in large part these were intended only to provide passage through the state, not bring settlers to stay. Again, as the mines boomed, Nevada became just as much a destination as it was a hindrance to western travel.

As mentioned previously, beginning in 1855 Major Howard Egan of the Mormon Battalion first traversed and three years later surveyed a route through central Nevada for Major George Chorpenning. In 1859, Capt. James Simpson led an expedition through the region resulting in the establishment of the first route through central Nevada, from Camp Floyd, Utah to Genoa, Nevada (Vlasich 1981:228; Welch (1979:6 in Bowers and Muessig, 1982:19). Although this route, originally known as the Egan-Simpson or Central route, proved unsuitable for a railroad, the route was suited to wagon traffic, and was quickly adopted by George Chorpenning's mail line, which used mules. Informally known as the "Jack-ass Mail" the operation was first established along the Humboldt River (Goetzmann 1966:293 in Bowers and Muessig, 1982). By December of 1859, George Chorpenning had built several stations along the new route (Godfrey, 1994), and one of these was located at Schellbourne (Townley, 1986:53). At the same time, Russel, Majors and Waddell, owners of the Central Overland California & Pikes Peak Express Company (COC&PP Express Co.), had been actively soliciting Congress for the establishment of a 10-day mail service by Pony Express from Sacramento to St. Joseph, Missouri, while at the same time laying out and establishing stations along the same route used by Chorpenning (Townley, 1986:7-8; Godfrey, 1994). In the wake of cash flow problems, Chorpenning's mail contract was terminated in May of

1860, and was promptly awarded to the COC & PP Express Co. Russel, Majors, and Waddell hoped by demonstrating "that the central route offered the best opportunity for mail or stage...the firm could inherit the (proposed route of the) Pacific railroad" (Townley, 1986:8). Between Salt Lake City and Placerville, California, Chorpenning's posts were taken over by the COC & PP Express Co., and others were added with whatever building material was available - rock, timber, adobe, or sod (Townley, 1986:8). This new subsidiary venture, more commonly known as the Pony Express Mail Service began in April of 1860. Within and in the vicinity of the proposed WPES Project a route remount station was established in the spring of 1860 at Egan Canyon and Chorpenning's station at Schellbourne (called the Schell Station by early residents) was enlarged (Townley, 1986:52-53). The route is currently overlain by a gravel road extending west from U.S. 93 at Schellbourne and is bisected by the proposed water supply pipeline ROW.

Operations of the Pony Express enterprise were not without problems, the first of which arose shortly after the system was put in place. Following, and apparently as a result of the Pyramid Indian War, raids by local Native American groups on Pony Express stations and riders occurred throughout Nevada and Utah. At the Egan Canyon station, a natural area for an ambush and a point where one of Chorpenning's riders was attacked in March of 1859, the Pony Express and local Native peoples came into conflict several times. Cavalrymen killed almost twenty Shoshone warriors in July of 1860, and in October the Shoshone stormed the station killing the two station tenders. Similar hostilities occurred at Schellbourne where the station was destroyed in June of 1860, supposedly by the same group that had attacked the Egan Canyon station. These disruptions in service were not only costly because of the loss of revenue, but required that the stations be rebuilt as small fortresses. Additional blows to the operation occurred during the winter of 1861, when deep snows resulted in numerous delays. This disruption in service coupled with the overwhelming debt and criminal charges against William Russell for stealing bonds from the Interior Department to support and maintain the Pony Express, and completion of the Overland Telegraph line on October 24, 1861, finally resulted in the failure of the enterprise (Godfrey, 1994). Although short-lived, 1860-61, the Pony Express demonstrated the importance of a Central route, which became even more important following the seizure of Butterfield's southern route by the Confederate army in January of 1861 (Townley, 1986:13).

Following the collapse of the Pony Express, competition for government contracts for the transportation of mail and passengers over the Central route ensued between the COC & PP Express Co. and Butterfield's Overland Mail Company. As a compromise, Congress awarded the COC & PP Express Co. the eastern portion of the route from the Missouri River to Salt Lake City. There, post and passengers were transferred to the Overland Mail Company, which completed the first run to San Francisco on July 18<sup>th</sup>, 1861 (Hafen, 1926:165ff; Townley, 1986:13).

A map of the Overland Stage and Pony Express routes across Nevada (Townley, 1986:10-11) indicates that the Overland Stage followed the same route as the Pony Express had through Steptoe Valley. When the Overland Stage began daily service they established Schellbourne as the district headquarters, with stonemasons from Utah constructing a headquarters building, wagon shops, and stock barns between 1862 and 1863. Townley (1986:54) notes:

A crew of twenty blacksmiths, wheelwrights and workmen operated shops capable for rebuilding stages from the

ground up. Storage yards kept the division's replacement equipment and winter supply of "mud wagons" ready for use. A paint shop could replace the gleaming exterior of the line's Concord coaches. Harness was repaired by experienced leather craftsmen and stored in elaborate warehouses. A five-acre garden kept the staff in vegetables and a farm crew harvested thousands of tons of hay, plus wagonloads of grain annually.

As the transcontinental railroad neared completion, overland mail and coach service retreated, and even the Overland Telegraph was re-routed along the railroad, following the joining of the Central Pacific and Union Pacific in May of 1869.

With the completion of the Transcontinental Railroad and the coming of the Central Pacific to the north of White Pine County, overland transportation took a dramatic turn. The largely isolated nature of eastern Nevada was rapidly coming to an end and new markets for the industrial and agricultural/ranch produce of the region soon emerged. Although the Central Pacific was situated well to the north of White Pine County, at first wagon roads and then the Nevada Northern Railway in late September of 1906 linked Ely to this route and provided easy transportation to other population centers such as Cherry Creek Station, Currie, and Elko (James, 1981; Myrick, 1992). Additional rail lines and spurs were established extending the route east to Copper Flat and another spur to McGill. Throughout the majority of its existence the line primarily carried copper ore to the processing plants at McGill. Roadways began to proliferate and improved conveyance of goods, services, and people across the landscape. Mack and Sawyer (1965) provide an excellent illustration of these developments in their study, which demonstrates a rapid increase not only in rail lines but in roadways and in the establishment of population centers in eastern Nevada between 1865 and 1910).

### **Nevada Northern Railroad**

As with many short-line railroads in Nevada, their formation was the result of mining, and in this case provided a means for the movement of blister copper from the rich deposits of the Robinson Mining District west of Ely. Early mining in the vicinity of Ely began in 1867 with the gold discoveries by Thomas Robinson, whose name the district is now known. The name Ely was the result of Frederick Thomas of Oakland, California, who named the emerging town of Ely after Smith Ely, a Vermont smelter operator and then president of Selby Copper Mining & Smelting Co. However, it was copper that made Ely famous and it all started with Mark Requa who was looking for additional business for the struggling Eureka & Palisade Railroad out of Eureka. He sent J.B. Stevens to look for new mineral deposits to the east of Eureka, who reported the extensive porphyry copper ore deposits in Copper Flat, just east of Ely. Subsequently Requa purchased the Star Pointer and Ruth Mines in 1902, and combined these into the White Pine Copper Company in 1903. With new technology it became apparent that the crystalline form of copper could be mined economically, and Requa looked for a method of shipping the commodity to market. While the Eureka & Palisade Railroad was only 75 miles to the west, it presented two obstacles. First, it was of narrow-gauge construction, which at the time was inferior to the wider standard gauge. Second, to construct a route from Eureka would mean traversing four mountain passes. It seemed logical that the most cost-effective route was north through

Steptoe Valley, via a nearly flat route with easy grades to a connection with the Central Pacific at or near Wells (Myrick, 1992:13-114).

William Hood, a Southern Pacific engineer, was selected to lead the construction of the route. He obtained the expertise of Adolph Judell, who had just finished working on a Southern Pacific route north of Chico, California, to survey the route. Judell selected a route down the center of Steptoe valley, which was supported by Hood among disapproval from others who believed that a route higher upslope would be preferable. Judell defended his selection by pointing out that an upslope route would be subject to intense channeled runoff from the higher elevations, whereas a route through the lowlands would be in an area where the flow would be spread out and less intense (Myrick, 1992:114).

With an influx of capital from W. Hickie Smith, a member of the Bullfrog Mining Syndicate, and approval from Southern Pacific for a connection the Nevada Northern Railway (NNR) was formally incorporated in June of 1905, and became part of the Nevada Consolidated Copper Company (NCCCo). Delayed by the severe winter of 1905-1906 the route south from Cobre (Spanish for Copper) reached Currie in the spring, Cherry Creek Station in July, and was completed to Ely in late September of 1906.

The route was extended 10 miles east into Copper Canyon and the copper mines west of Ely, which required the construction of two tunnels. It is said these 10 miles cost as much to construct as the entire 140 miles from Cobre to Ely. Other additions included a route to McGill, which was used to transport high school students to Ely, and a nine-mile Hiline built in 1907 to bring ore to the concentrator upslope of McGill.

While the processing and transporting of copper ore by far made up the bulk of the business of the tonnage shipped by the company, passenger service and commercial freight also contributed to its economic success in the early years of operation. However, with improved highways, public use declined and passenger service was suspended in July of 1941.

Before the route to the mines and McGill could be completed, the Guggenheim interests purchased sufficient stock to obtain working control of the NCCCo. S. W. Eccles became the new president of both organizations and with the infusion of additional capital the smelter planned for McGill was doubled in size. In 1932, Kennecott Copper gained control of NCCCo, forming the Nevada Consolidated Copper Corporation to run properties in Nevada, Arizona, and New Mexico. Late in 1942 the Nevada properties were reorganized under the name of the Nevada Mines Division of Kennecott Copper Corporation. With declines in the economies of scale brought about by declining copper prices, Kennecott donated the East Ely depot and yards, the McGill depot, and 32 miles of track to the City of Ely, which formed the White Pine County Historical Railroad Foundation. The depot and rail yards are currently listed on the NRHP and the foundation is in the process of listing these facilities as a National Historic Landmark (Myrick, 1992:133-134). However, the significance of the NNR is not just related to its infrastructure, but the connection with the Robinson Mining District and the part it played in the early development of the district that has been referred to as the richest mining district in Nevada History (Elliott, 1987:226).

Another use of the NNR was in 1908, when this appears to have been the route of the Great Race. The event was sponsored by the New York Times and featured an automobile race

from New York City to Paris. According to Southwell (2006), the route went south through Steptoe Valley following the NNR, through Ely, and then on to Tonopah.

### **Highway Development and the Lincoln Highway**

As the 20<sup>th</sup> century progressed, railroads remained the primary means of moving people and goods within and through Nevada, but the automobile was fast becoming a major player on the transportation scene. Tasker L. Oddie, who became Nevada governor in 1911, could see the developing importance of the automobile and one of his first official acts was to authorize the State Engineer to utilize convicts for road construction. Although this plan eventually failed, it established the concept and priority of building modern roads throughout the state. However, by 1914, only 262 miles of Nevada's 12,812 miles of existing roadway were paved and Nevada had a long way to go to provide for the automobile.

An exception was the establishment of the Lincoln Highway in 1913, which was one of America's first transcontinental automobile routes, beginning in Times Square in New York City and ending at the Palace of Legion of Honor in San Francisco. This was the vision of Carl Fisher, the founder of the Presto-O-Lite Company that made headlights for automobiles. He, along with help from Henry Joy of Packard Motor Car Company and Frank Sieberling of Goodyear Tire and Rubber Company formed the Lincoln Highway Association in 1913. At first the route was called the "Coast to Coast Rock Highway" but following input from Henry Joy, the name was changed to the Lincoln Highway in honor of President Abraham Lincoln. However, the motives varied among the founders. They included the desire to build an appropriate memorial to the fallen President, as well as the desire to grow their automotive businesses (National Park Service 2004).

Americans viewed the emergence of the Lincoln Highway, and the automobile as a manifestation of a modern equivalent of the Oregon Trail or as an equivalent of freedom from travel via the Transcontinental Railroad. The highway and automobile freed the populous to travel and enjoy the spectacles and all of their glamour thorough the entire United States without constraints. In 1913 Carl Fisher led a group of 19 automobiles from Indianapolis to reconnoiter a route to the Pacific Coast. He insisted that the route taken would not necessarily be the one chosen for the Lincoln Highway, but state and local governments worked to improve routes just in case. For example, Nevada spent \$25,000 in road improvements and several events were held at each stop where the entourage was wined and dined by high-ranking political figures, including the governor of Nevada (National Park Service 2004).

Several important events occurred during the early years of the highway. They included the first Army Transcontinental Motor Convoy in the summer of 1919 and the official marking of the route in 1928, when Boy Scout troops placed 3,000 concrete markers bearing the Lincoln Highway logo (an "L" in a rectangular graphic emblazoned in red, white, and blue), a bronze medallion of President Lincoln, and a blue directional arrow along the length of the highway (National Park Service 2004).

While politics played a role in the final selection of the route, it primarily was determined by geography. Although not the only transcontinental route in the early 20<sup>th</sup> century, it was the best known. The modern route of Interstate 80, the route of the immigrant trail that follows the Humboldt River, is a far superior route compared to the central Nevada route,

which crosses several mountain passes exceeding 7,000 feet elevation. However, in Utah the early route of the Lincoln Highway was primarily determined by the geography. The Great Salt Lake Desert blocked the way west from Salt Lake City, until limited funds were available for construction of a raised roadway across the barren salt flats. Because of this, the early route went around the south end of the desert to Ely. However, the popularity of this route began to decline after 1919 when the State of Utah abandoned their commitment to complete the Lincoln Highway's Goodyear Cutoff at the southern tip of the Great Salt Lake Desert in favor of a 40 mile long route to Wendover, which became known as part of the Victory Highway.

The Lincoln Highway Association formerly abandoned the Ely route for the Wendover route with the stipulation that Nevada build an 80-mile route south from Wendover linking the new and old routes. The final blow to the route through White Pine County was in 1927 when the Lincoln Highway Association abandoned the route through Ely for the Wendover route. As a result, Nevada built an 80-mile route south to link up with the Lincoln Highway south of County Road 18 north of Ely. By the time the route was completed in 1930, the more direct Victory Highway (U.S. 40) along the Humboldt River Valley had been improved sufficiently to capture most of the traffic traveling across the Great Basin.

Additional alterations to the route were made in the 1920s. Large portions of the route between Ely and Eureka were completely relocated northward during the early 1920s and are currently followed by U.S. 50. Another change in the route is just west of Schellbourne Pass, where there is a split in the road, with the early 1913 route descending to Schellbourne Ranch, and the right (north) branch being an upgraded route established in 1919 (Franzwa, 2004:8). However, except for the route to Wendover, which was completed in 1930, the route through Steptoe Valley has remained in its original alignment established in 1913.

One original rest stop, Magnuson Ranch, remains in Steptoe Valley. The house that served as a rest stop beginning in 1913 is still standing, but is no longer occupied. The 1915 Road Guide describes the ranch as a place to obtain "Meals, lodging, gas, oil, drinking water, radiator water, camp site." In 1924 "telephone" had been added to the guidebook (Franzwa, 2004:8)

By the mid-1920s the named routes overlapped and were poorly routed. Therefore, in 1925 and 1926 the American Association of State Highway Officials and the U.S. Bureau of Public Roads undertook the task of identifying and marking the various east-west transcontinental routes into a grid of nine major routes numbered U.S. 2, 20, 30, 40, 50, 60, 70, 80, and 90. The Lincoln Highway was designated U.S. 30 for most of its length. However, it retained its popular identity as the Lincoln Highway until 1956 with the passage of the Federal Aid Highway Act and development of the modern interstate system.

**Appendix H**

**Documentation of the Application of a  
Numerical Model to Simulate Ground Water Response  
to Pumping for the Proposed White Pine Energy Station  
in Steptoe Valley, Nevada**



# Documentation of the Application of a Numerical Model to Simulate Ground Water Response to Pumping for the Proposed White Pine Energy Station in Steptoe Valley, Nevada

PREPARED FOR: White Pine Energy Station EIS Project File  
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DATE: September 13, 2006

## Introduction

Ground water from the basin-fill deposits in Steptoe Valley is proposed as the source of water for the White Pine Energy Station (WPES), a proposed up to 1,600-megawatt coal-fired electrical generating station to be located in Steptoe Valley, White Pine County, Nevada. The maximum annual water demand for the WPES is approximately 5,000 acre-feet (af). For the purpose of the analyses in this technical memorandum, the maximum project life with respect to this water demand is 40 years. This demand would be met through pumping from a wellfield composed of 8 wells, which are not yet constructed. The principal features of the proposed project, including the locations of each well in the wellfield, are shown in Figure 1 for the Proposed Action and in Figure 2 for Alternative 1.

The principal objective of this technical memorandum is to document the use of a numerical ground water flow model to simulate the response of the Steptoe Valley basin-fill aquifer system to ground water pumping required to meet the project demand for water, up to 5,000 acre-feet per year for 40 years. Although this demand for water would be the same for either the Proposed Action or Alternative 1, the demand would be met through the operation of two different wellfields, each consisting of eight water supply wells in a linear configuration on the valley floor roughly parallel to U.S. 93. Specifically, for the Proposed Action, the eight wells in the proposed wellfield would be located at intervals of between approximately 1 and 3 miles extending from the proposed energy station location northward for approximately 12 miles. The eight wells in the proposed wellfield for Alternative 1 would be located at intervals of between approximately 1 and 2.5 miles extending from the Alternative 1 energy station location south for approximately 5 miles.

This technical memorandum has been prepared to support the environmental documentation for the proposed WPES, which is being developed by White Pine Energy Associates, LLC, a wholly owned subsidiary of LS Power Development, LLC.

## Ground Water Flow Model

Inasmuch as multiple wells would be required to meet the project water demand, a numerical ground water flow model was determined to be the most appropriate tool to determine a reasonable range of potential ground water level declines in the Steptoe Valley that could be anticipated to occur as a result of project specific ground water withdrawals in support of either the proposed action or the alternative energy station location.

In determining a reasonable range of anticipated decline in ground water levels, the principal objective is to gain an understanding the difference in ground water levels between non-project pumping and project pumping. A complete understanding of the current water levels is therefore not required; only the change in water level brought about by project pumping is important.

Accordingly, the simulation of potential project-induced ground water level decline was conducted using a revised version of a numerical model previously developed, in part, to examine the potential consequences of pumping from the same well locations as proposed for the WPES. Specifically, the model developed by Frick (1985) was re-created using grid dimensions and estimates for model input parameter values that matched as closely as possible the ones used previously by Frick. In addition, the model in Frick (1985) was revised to simulate transient conditions. The original model solved only for steady-state hydraulic heads.

Although the Frick model was calibrated to conditions in the mid-1980s, it was determined to be an appropriate tool to address the fundamental issue of potential project-induced ground water level declines (i.e., it sufficiently represents the ground water conditions in the basin-fill aquifer system in the Steptoe Valley to be able to provide reasonable approximations of the change in ground water levels that would occur as a result of project pumping). Frick (1985) acknowledges that although the model was considered calibrated, there were (and are in 2006) insufficient data to verify that the model can reproduce a historical hydrogeologic condition that is independent of or different from the conditions reproduced during calibration. Nevertheless, the calibrated model was still considered to be a valuable tool to test hypotheses about the basin-fill ground water system and its response to different stresses (Frick, 1985). The model developed by Frick (1985), and the one subsequently used for these analyses, is based on the three-dimensional finite difference ground water flow model commonly referred to as MODFLOW, which was first developed by McDonald and Harbaugh (1984) and subsequently formally documented in McDonald and Harbaugh (1988). Since initially published, MODFLOW has been updated to run on personal computers using Windows®-based platforms, and to simulate more complex ground water environments and boundary conditions with more efficient matrix solver routines. In re-creating Frick's model, the MODFLOW 96 version in Ground Water Vistas® 4.20 (GWV) was used. This version essentially uses the same basic computer code as originally published and, therefore, used in Frick (1985).

## Principal Assumptions

The following assumptions provide important context for the model setup and subsequent simulation results:

- Fundamentally, the most important assumption is that the conceptual model of the Steptoe Valley basin-fill aquifer system developed by Frick (1985) is sufficiently accurate, and that the subsequent representation of the conceptual model by the MODFLOW-based model is also reasonable for the purpose of meeting the objectives of the simulations for the WPES environmental documentation. Accordingly, the lateral and vertical extent of the simulated problem domain, the finite-difference grid dimensions, the values for fundamental model input parameters, and the initial and boundary conditions for the re-created model are as close as possible to those employed by Frick (1985).
- Actual operating conditions for the project wellfield have not yet been determined. Therefore, each project well was pumped at the same rate ( $5,000 \text{ af/year} \div 8 \text{ wells} = 387 \text{ gallons per minute [gpm]}$ ) continuously for 40 years).
- In Frick (1985), background (non-project) ground water withdrawals were held constant at 20,289 af/year, and this rate was apportioned to different finite-difference cells based on known local pumping centers as of 1985. For the re-created model, background ground water pumping was held constant at the combined estimated rate as of 2000 (6,360 af/year), which is the last year for which published estimates of ground water withdrawals in Steptoe Valley are available (Lopes and Evetts, 2004). However, the current spatial distribution of pumping in Steptoe Valley is unknown; consequently, the same pumping areas identified in Frick (1985) were used in the re-created model, but with the pumping rate of 6,360 af/year evenly distributed across the same finite-difference cells identified as pumping cells in Frick (1985).
- The model developed by Frick (1985) only solved for steady-state hydraulic heads. Accordingly, storage properties of the aquifer system were neither quantified nor accounted for in the model input data in Frick (1985)<sup>1</sup>. However, to simulate ground water level declines after 40 years of project pumping, transient head solutions are required. Inasmuch as the solution to the partial differential equation for anisotropic time-dependent ground water flow requires that storage properties be known or assumed, appropriate values of both specific yield ( $S_y$ ) and storage coefficient ( $S$ ) are required for model layers representing unconfined and confined conditions, respectively. For the re-created model, it was assumed that the values of  $S_y$  and  $S$  would be constant in space. Specifically, the value of  $S$  applied to model Layers 2 and 3 representing confined conditions (see Model Setup section below) was  $1 \times 10^{-4}$  following sensitivity testing that revealed essentially no difference between results with  $S = 10^{-3}$  and  $S = 10^{-5}$ . A value of  $S = 10^{-4}$  is consistent with the results of aquifer testing in Steptoe Valley reported in Leeds, Hill, and Jewett (1983). However, simulation results were

<sup>1</sup> Under steady-state conditions, the right-hand side of the partial differential equation for ground water flow:

$$\frac{\partial}{\partial x} \left( K_x \frac{\partial h}{\partial x} \right) + \frac{\partial}{\partial y} \left( K_y \frac{\partial h}{\partial y} \right) + \frac{\partial}{\partial z} \left( K_z \frac{\partial h}{\partial z} \right) + W = S_s \frac{\partial h}{\partial t}$$

goes to zero because  $\frac{\partial h}{\partial t} = 0$ ; therefore, under steady-state conditions, aquifer storage properties (specific storage [ $S_s$ ]) are irrelevant. For the definitions of the other terms in this equation see, for example, Freeze and Cherry (1979).

sensitive to changes in the value of  $S_y$  assigned to Layer 1. For example, a value of  $S_y = 0.05$  ultimately resulted in drawdowns in response to project pumping of between 1 and 10 feet higher than when  $S_y = 0.25$ . The greatest differences in drawdowns resulting from the different values of  $S_y$  were closest to the pumping centers while the smallest differences were at the margins of the cone of depression for the wellfield<sup>2</sup>. A value of  $S_y = 0.05$  was used in the final simulations because it was the lowest reasonable value that was consistent with the documented near-surface lithology (see, for example, Clark and Riddell, 1920; Leeds, Hill, and Jewett, 1983). Selecting the lowest of the range of reasonable values of  $S_y$  maximizes the resulting simulated wellfield drawdowns in Layer 1.

## Model Setup

### Problem Domain and Model Grid

The simulated problem domain and the associated finite-difference grid are shown in Figure 3 relative to the location of the proposed wellfield under the Proposed Action, and in Figure 4 relative to the location of the proposed wellfield under Alternative 1. The problem domain and lateral (x-y) dimensions of the model grid are the same for both the Proposed Action and Alternative 1, and are the same as employed in Frick (1985) with the grid spacing of  $\Delta x = 5,280$  feet (1 mile) and  $\Delta y = 10,560$  feet (2 miles). The x-offset of the grid in GWV was 2215399.51, and the y-offset was 14118722.49 (NAD27, UTM 11N). These offsets placed the bottom left (southwest) corner of the finite difference grid as close to actual coordinates as possible.

In the vertical dimension, the problem domain was discretized into three layers following the approach in Frick (1985). The upper-most layer (Layer 1) represents the upper 100 feet of saturated thickness, and is assumed to be unconfined (LAYCON=1). Layer 2 represents the principal confined aquifer unit (LAYCON=0) and extends from the bottom of Layer 1 to approximately 1,000 feet below land surface at the lowest point along the east-west width of the valley. Layer 3, which is also confined, is below Layer 2 and represents deep ground water which, while not tapped directly by wells, influences the hydraulic response to pumping from Layer 2 (imposing a no-flow boundary at the base of Layer 2 would be inappropriate because it would limit the water available to deep wells).

The elevation and thickness (layer tops and bottoms) were created by approximating layer thickness directly from Figure 15a and 15b in Frick (1985). Specifically, the lowest point on Figure 15b was selected as the base elevation datum in the model (zero elevation). All other layer elevations in the model are a particular value above the datum based on the approximated thickness from Figure 15b in Frick (1985). While every effort was made to duplicate the layering discretization in the previous model, this portion of the model setup was not very well documented in Frick (1985). The resulting inherent differences in the vertical discretization between the two models ultimately led to the greatest differences in the solutions produced by the two models.

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<sup>2</sup> Sensitivity testing indicated that at the margins of the cone of depression for the wellfield there was no significant difference in the results between  $S_y = 0.05$  and  $S_y = 0.1$ .

Hydraulic connection between the layers is simulated through confining layers that are not specifically represented spatially by the model but are approximated through leakance parameters (these confining layers only transmit water in the vertical direction and are not capable of storing water).

## Model Input Parameters

The values of the basic model input parameters (hydraulic conductivity, leakance, recharge, evapotranspiration) including grid specifics were taken from Frick (1985), and are presented spatially in Figure 5 through Figure 14.

## Boundary Conditions

Boundary conditions for MODFLOW are: no-flow finite-difference cells (deactivated cells outside the model domain); ground water pumping cells (both non-project and project wells); stream cells representing Duck Creek and Steptoe Creek; and general head boundary (GHB) condition cells.

The GHB package in MODFLOW was used to represent ground water flow north from Steptoe Valley into Goshute Valley in the vicinity of Currie. The GHB cells are identified in Table 1.

TABLE 1  
General Head Boundary Condition Location and Properties

Layer	Row	Column	Head Elevation (feet)	Width (feet)	Distance to GHB head (feet)	Hydraulic Conductivity (feet/day)	Saturated Thickness (feet)	Resulting Conductance (feet <sup>2</sup> /day)
1	2	15	2,010	5,280	1,000	32.73	10	1.72x10 <sup>3</sup>
2	2	15	2,010	5,280	1,000	49.09	10	2.59x10 <sup>3</sup>
3	2	15	2,010	5,280	1,000	49.09	10	2.59x10 <sup>3</sup>

The stream package was applied to 61 cells in the model according to the routing detailed on Figure 22 in Frick (1985). The revised model employed the "compute stream stages" option available in GWV, based on the flux into the first stream segments (Row 42, Column 13, for Steptoe Creek and Row 31, Column 14, for Duck Creek) from Frick (1985).

## Project Wellfield

The project wellfield consists of eight proposed wells at the locations (grid coordinates) listed in Table 2 (see also Figure 1).

TABLE 2  
Location Coordinates of Project Wells

Well	Northing	Easting
<b>Proposed Action</b>		
Well 1	4401344.6525	689856.4924

TABLE 2  
Location Coordinates of Project Wells

Well	Northing	Easting
Well 2	4399175.8120	689638.5035
Well 3	4413857.0747	692195.6371
Well 4	4416670.1487	692752.2903
Well 5	4419738.1191	693337.5647
Well 6	4410490.9652	691003.9852
Well 7	4407677.4845	690556.2981
Well 8	4405261.0926	690295.4449
<b>Alternative 1</b>		
Well 1	4372077.3005	687459.3944
Well 2	4374074.0148	686996.0219
Well 3	4376159.1912	687733.2054
Well 4	4377894.7320	688002.8040
Well 5	4378720.3776	687160.3085
Well 6	4380118.9202	687130.8211
Well 7	4381715.4492	687113.9712
Well 8	4382827.5433	688331.3772

For simulations involving the project wellfield, each well was assigned the pumping value of -74,589 cubic feet per day (387 gpm) for the entire period of simulated time. Note, the negative sign signals pumping to the model; a positive value would signal injection.

## Time Steps

Transient simulations involved representing the 40-year period of simulated time through 40 stress periods of 365 days, with 100 time steps per stress period and a multiplier of 1.2 (the ratio of the length of each time step to that of the preceding time step).

## Sensitivity Analysis

Extensive sensitivity testing of model input parameter values and analysis of the subsequent results were conducted and documented by Frick (1985). In addition, the effects of the results of the sensitivity analysis on the final calibration of the model were also documented by Frick (1985). Reasonable ranges of input values representing stream flow, aquifer transmissivity (including both aquifer thickness and hydraulic conductivity), evapotranspiration, recharge, and the northeast boundary condition (i.e., the GHB condition cells representing flow from Steptoe Valley to Goshute Valley). The results of the sensitivity testing at the time the original model was developed are summarized in Table 7 of Frick (1985).

In addition, as discussed above under Principal Assumptions, sensitivity Analysis was conducted on values of aquifer storage coefficient and specific yield.

## Model Simulations

### Steady-State Comparison with Frick (1985)

The first simulation by the re-created model was of the steady-state flow field with only non-project pumping. For this simulation, the background pumping was set in the re-created model to 20,300 af/year to be consistent with Frick (1985). The resulting water budget components are compared against those from Frick (1985) in Table 3.

TABLE 3  
Simulated Water Budget Components: Steady-State Steptoe Valley Base Scenario (Background Pumping Only)

Water Budget Component	Frick (1985) Simulation Results (af/year)	Re-Created Model Simulation Results (af/year)
<b>In</b>		
Recharge	83,600	79,390
Stream Leakage	15,300	12,817
<b>Total</b>	<b>98,900</b>	<b>92,207</b>
<b>Out</b>		
Wells	20,300	20,300
Evapotranspiration	76,200	68,072
Stream Leakage	0	1,199
Head Dependent Boundary (Flow to Goshute Valley)	2,510	2,640
<b>Total</b>	<b>99,010</b>	<b>92,211</b>

The results indicate that the overall water budget is approximately 7 percent less in the results of the re-created model relative to the budget reported by Frick (1985), but that the budget balances well in both models. One notable point is that the re-created model required some reaches of either (or both) Duck Creek or Steptoe Creek to gain flow from ground water. This is inconsistent with conditions observed in the field and the results produced by Frick (1985). This error directly resulted in the difficulty to match the vertical discretization in the two models. However, the error is not considered significant with respect to the ability of the re-created model to represent reasonably the project wellfield and simulate time-dependent ground water level declines as a result of project pumping.

### Transient Simulation Results

For the purpose of determining the magnitude of ground water level declines after 40 years of project pumping for the Proposed Action and Alternative 1, the re-created model was used to simulate three different future pumping scenarios. The first scenario involved the

simulation of the base case, which is ground water conditions 40 years into the future in the absence of ground water withdrawals for the proposed project (only non-project ground water pumping of 6,360 af/year was included in the simulation). The resulting ground water budget components from this simulation are summarized in Table 4.

TABLE 4  
Simulated Water Budget Components – 40-Year Base Scenario (Background Pumping Only)

Water Budget Component	Re-Created Model Simulation Results (af/year)
<b>In</b>	
Storage	2,840
Recharge	79,390
Stream Leakage	9,923
<b>Total</b>	<b>92,153</b>
<b>Out</b>	
Storage	313
Wells	6,360
Evapotranspiration	82,474
Stream Leakage	340
Head dependent Boundary (Flow to Goshute Valley)	2,654
<b>Total</b>	<b>92,141</b>

The second scenario was the same as the first, but with the addition of project pumping using the Proposed Action wellfield configuration (40-year simulation of ground water conditions with both project [Proposed Action] and non-project [No Action Alternative] pumping). The resulting ground water budget components from this simulation are summarized in Table 5.

TABLE 5  
Simulated Water Budget Components – 40-Year Combined Pumping Scenario (Background and Project Pumping) – Proposed Action Wellfield Configuration

Water Budget Component	Re-Created Model Simulation Results (af/year)
<b>In</b>	
Storage	3,572
Recharge	79,390
Stream Leakage	9,924
<b>Total</b>	<b>92,886</b>
<b>Out</b>	
Storage	338
Wells	11,360
Evapotranspiration	78,183
Stream Leakage	342
Head dependent Boundary (Flow to Goshute Valley)	2,654
<b>Total</b>	<b>92,877</b>

The last scenario was the same as the first, but with the addition of project pumping using the Alternative 1 wellfield configuration (40-year simulation of ground water conditions with both project [Alternative 1] and non-project [No Action Alternative] pumping). The resulting ground water budget components from this simulation are summarized in Table 6.

TABLE 6  
Simulated Water Budget Components – 40-Year Combined Pumping Scenario (Background and Project Pumping) – Alternative 1 Wellfield Configuration

Water Budget Component	Re-Created Model Simulation Results (af/year)
<b>In</b>	
Storage	3,061
Recharge	79,390
Stream Leakage	9,865
<b>Total</b>	<b>92,316</b>
<b>Out</b>	
Storage	340
Wells	11,360

TABLE 6

Simulated Water Budget Components – 40-Year Combined Pumping Scenario (Background and Project Pumping) – Alternative 1 Wellfield Configuration	
Water Budget Component	Re-Created Model Simulation Results (af/year)
Evapotranspiration	77,638
Stream Leakage	312
Head dependent Boundary (Flow to Goshute Valley)	2,654
<b>Total</b>	<b>92,303</b>

The difference in hydraulic head between the base case scenario and Proposed Action and Alternative 1 represents the change in ground water levels caused solely by project pumping (8 project wells pumping 625 gpm continuously for 40 years). The project-induced drawdown in Layer 1 (shallow unconfined aquifer) under the Proposed Action is presented in Figure 15, and the results for Layer 2 (deeper confined ground water) under the Proposed Action are presented in Figure 16. The project-induced drawdown in Layer 1 (shallow unconfined aquifer) under Alternative 1 is presented in Figure 17, and the results for Layer 2 (deeper confined ground water) under Alternative 1 are presented in Figure 18.

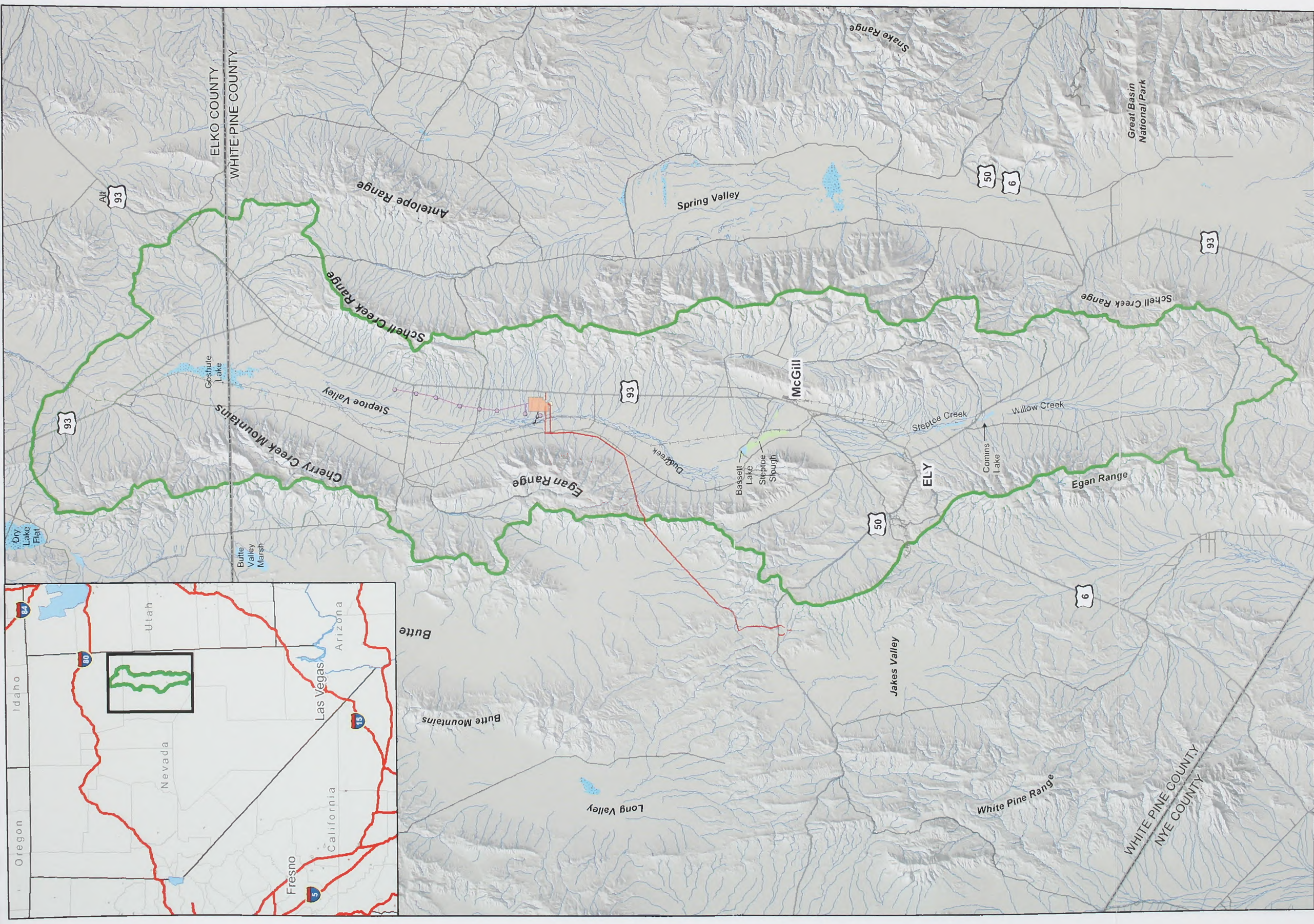
The results indicate a project-induced drawdown for the Proposed Action of up to 8 feet in Layer 1 and 8.5 feet in Layer 2. The results for Alternative 1 indicate a project-induced drawdown of up to 2.5 feet in Layer 1 and Layer 2. The significance of these drawdowns with respect to other water resources features (creeks, lakes, and springs) and other (non-project) points of ground water diversion is discussed in the WPES EIS.

## References

- Clark, W. O. and C.W. Riddell. 1920. *Exploratory Drilling for Water and Use of Ground Water for Irrigation in Steptoe Valley, Nevada*. U.S. Geological Survey Water Supply Paper 467.
- Freeze, R. A., and J. A. Cherry. 1979. *Groundwater*. Prentice-Hall Inc. Englewood Cliffs, New Jersey.
- Frick, E. A., 1985. "Quantitative Analysis of Groundwater Flow in Valley-Fill Deposits in Steptoe Valley, Nevada." Unpublished thesis for Master of Science in hydrology, University of Nevada, Reno.
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- McDonald, M. G. and A.W. Harbaugh, 1984. *A Modular Three-Dimensional Finite-Difference Ground-Water Flow Model*. U.S. Geological Survey Open-File report 83-875. 528 p.
- McDonald, M. G. and A.W. Harbaugh, 1988. "A Modular Three-Dimensional Finite-Difference Ground-Water Flow Model." *Techniques of Water-Resources Investigations of the United States Geological Survey*. Book 6, Chapter A1.





**Figure 1**  
**WPES Proposed Action**  
**Project Location**

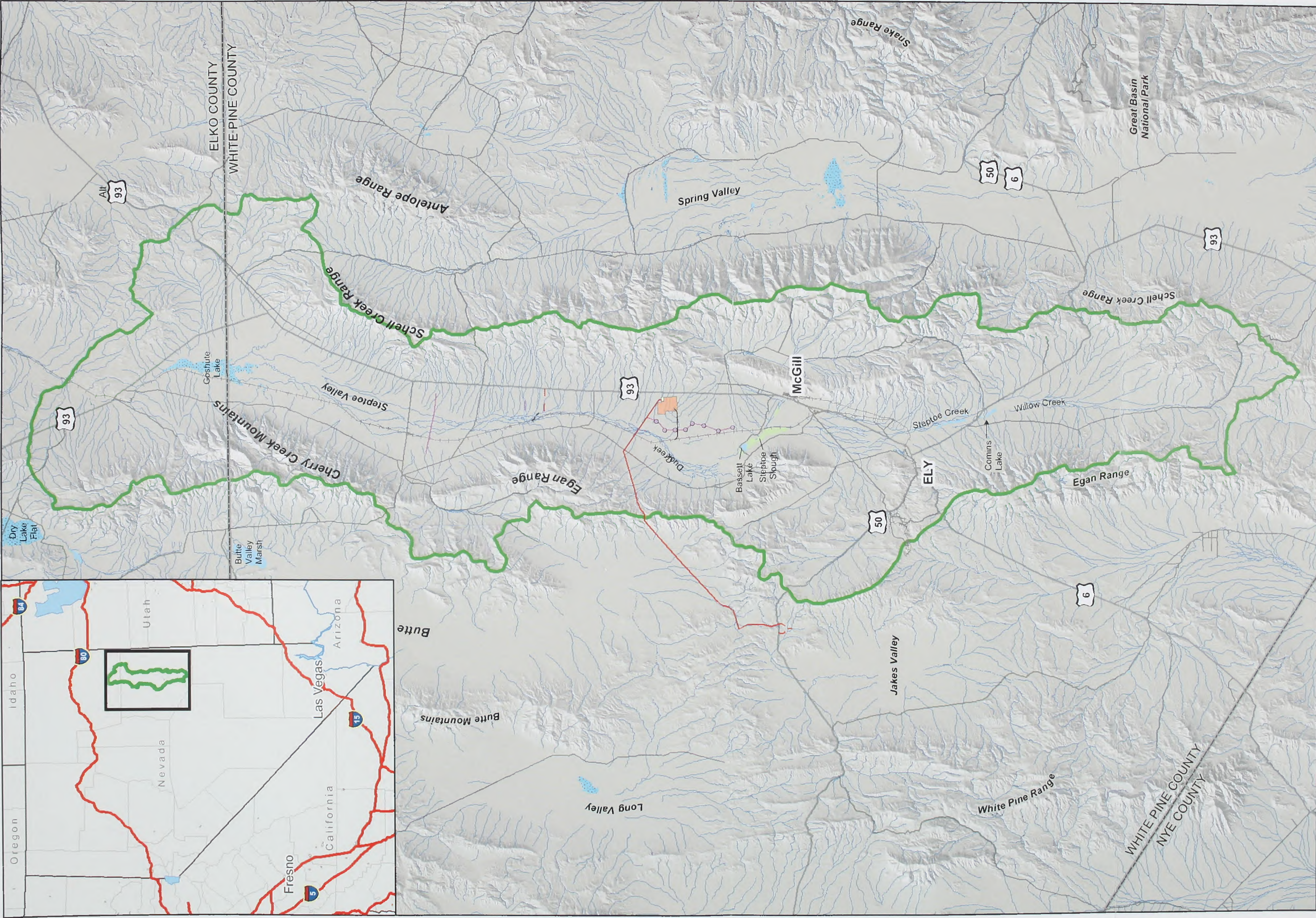
**Legend**

Power Plant Well	Road	Power Plant Site	Wetland (from Nevada Natural Heritage Program)
Water Line	Railroad	Substation	Natural Heritage Program
Transmission Line	Stream or Ephemeral	Hydrographic Boundary	Intermittent Water
Railspur	Drainage	Lake	

0 2 4 8 Miles

N





**Figure 2**  
**WPES Alternative 1**  
**Project Location**

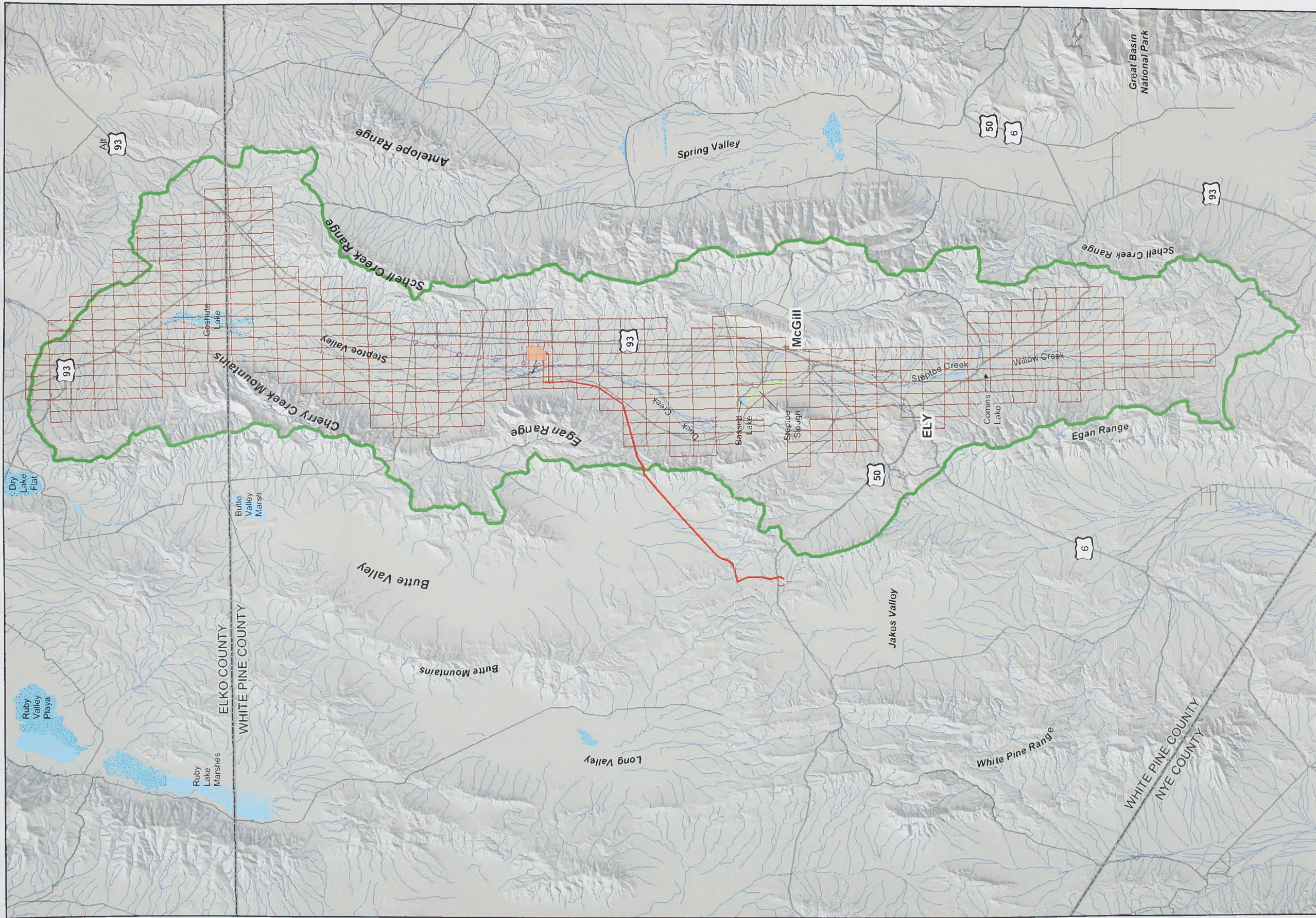
**Legend**

Power Plant Well	Road	Power Plant Site	Wetland (from Nevada Natural Heritage Program)
Water Line	Railroad	Substation	Natural Heritage Program
Transmission Line	Stream or Ephemeral Drainage	Hydrographic Boundary	Intermittent Water
Railspur		Lake	

0 2 4 8 Miles

N





**Legend**

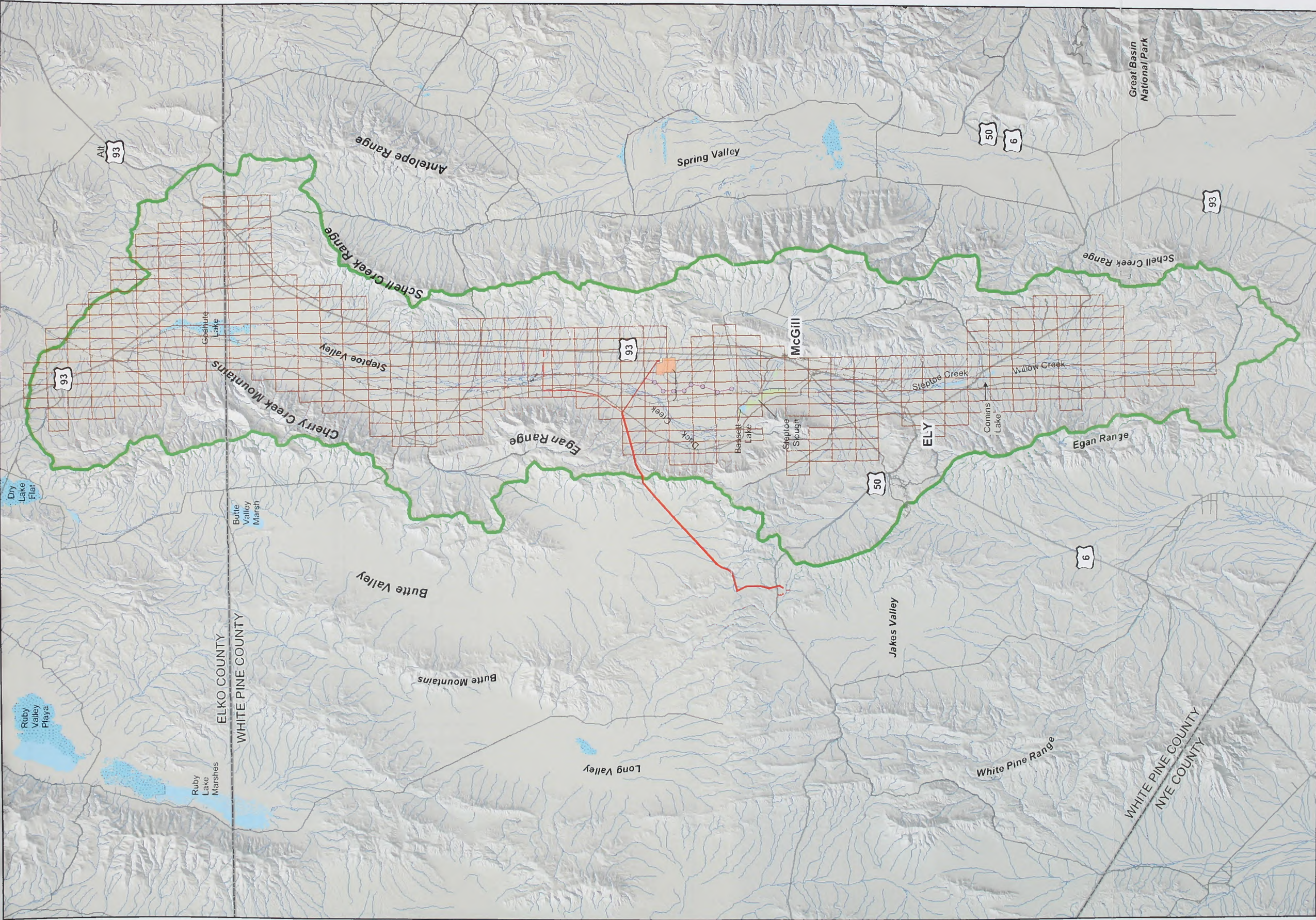
- Power Plant Well
- Water Line
- Transmission Line
- Railspur
- Road
- Railroad
- Stream or Ephemeral Drainage
- Power Plant Site
- Substation
- Hydrographic Boundary
- Lake
- Wetland (from Nevada Natural Heritage Program)
- Intermittent Water

**Figure 3**  
**Proposed Action**  
**Finite - Difference Grid**

0 3 6 12 Miles

N





**Legend**

- Power Plant Well
- Water Line
- Transmission Line
- Railspur
- Road
- Railroad
- Stream or Ephemeral Drainage
- Power Plant Site
- Substation
- Hydrographic Boundary
- Lake

- Wetland (from Nevada Natural Heritage Program)
- Intermittent Water



**Figure 4**  
**Alternative 1**  
**Finite - Difference Grid**



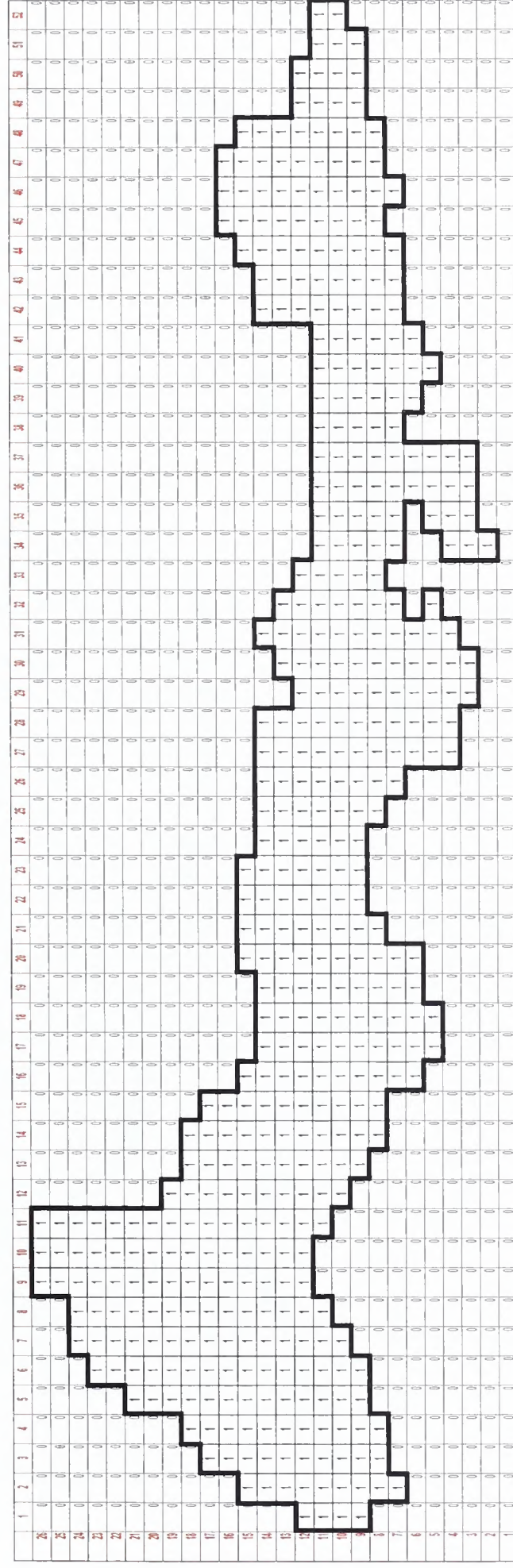
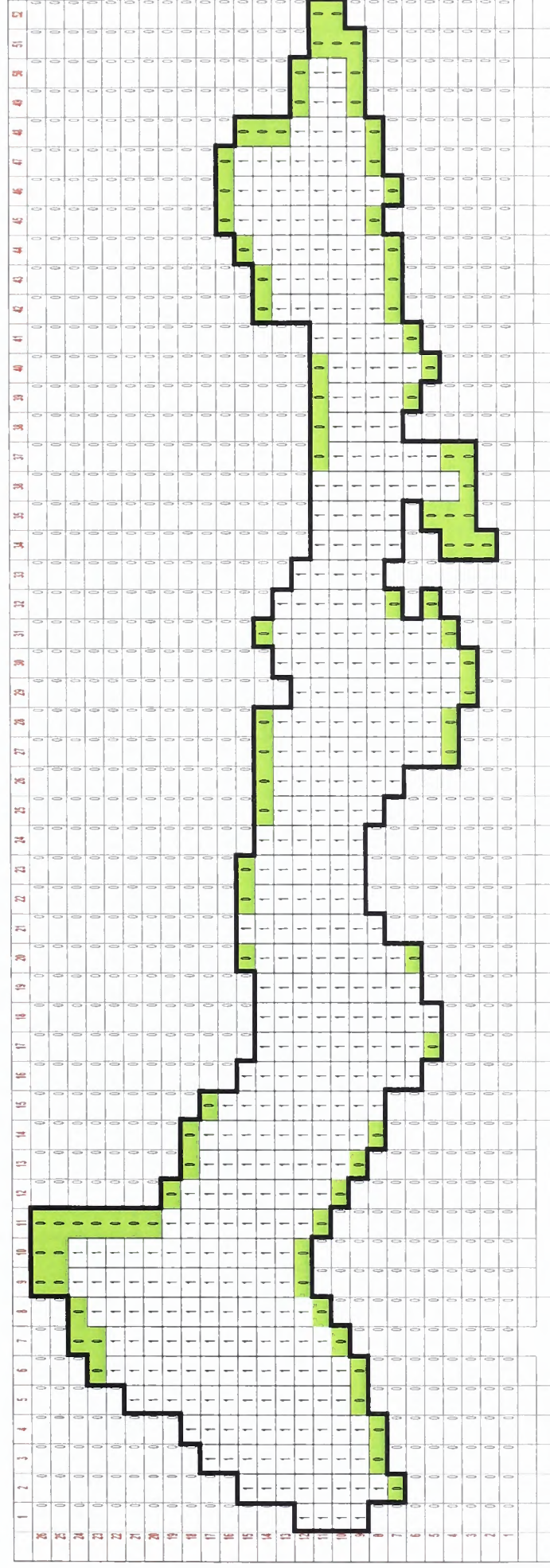


Figure 5  
Finite-difference grid (layers 1 & 2)





Cell in Layer 1 and 2 that is eliminated in Layer 3

Figure 6  
Finite-difference grid (layer 3)



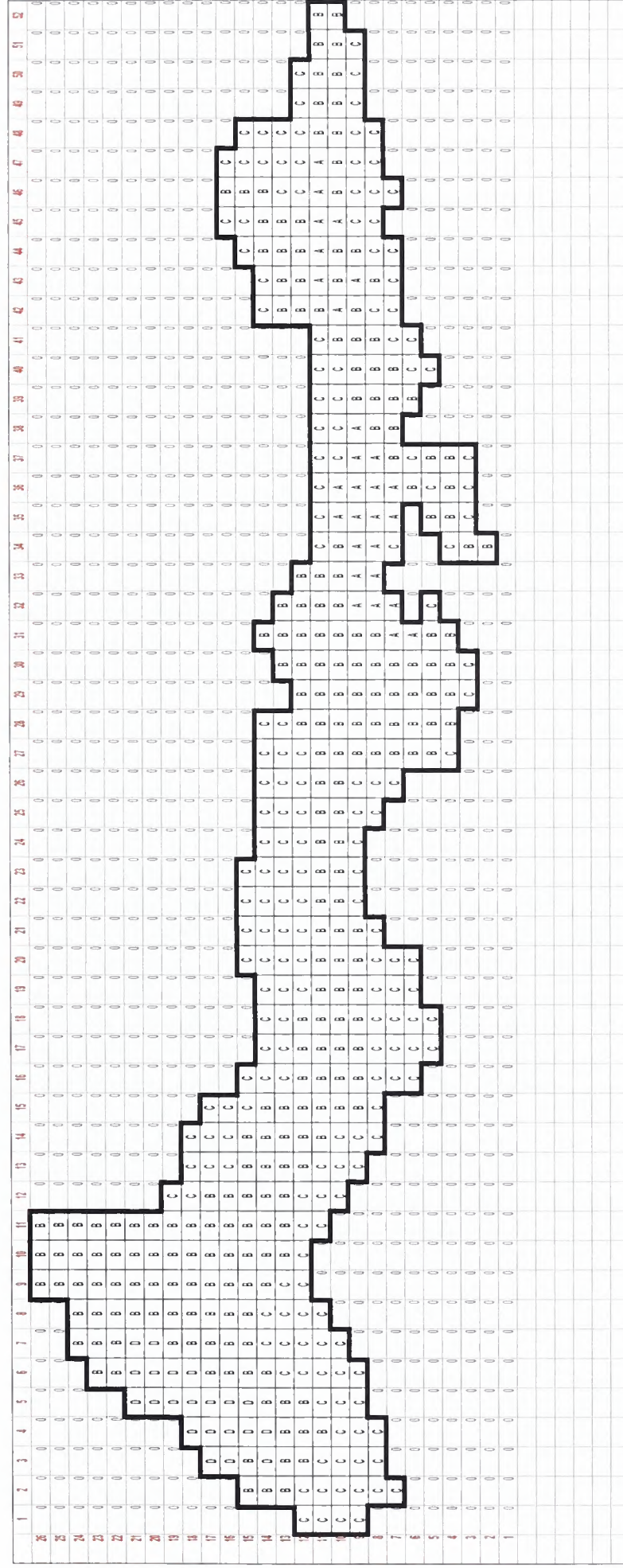
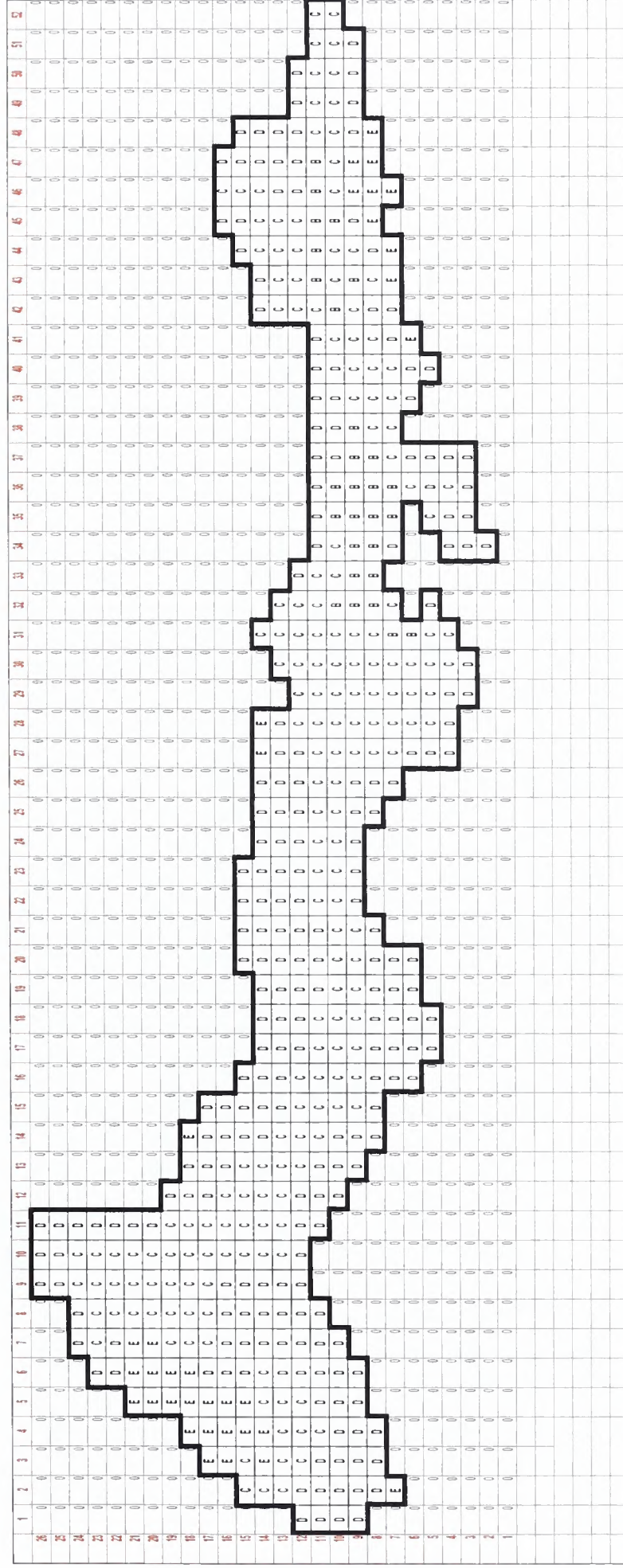


Figure 7  
Hydraulic conductivity(K) distribution (layer 1)





A = 0.1-0.155 ft<sup>2</sup>/sec  
 B = 0.05-0.099 ft<sup>2</sup>/sec  
 C = 0.01-0.049 ft<sup>2</sup>/sec  
 D = 0.001-0.0099 ft<sup>2</sup>/sec  
 E = 0.0001-0.0009 ft<sup>2</sup>/sec

Figure 8  
 Transmissivity (T) distribution (layer 2)



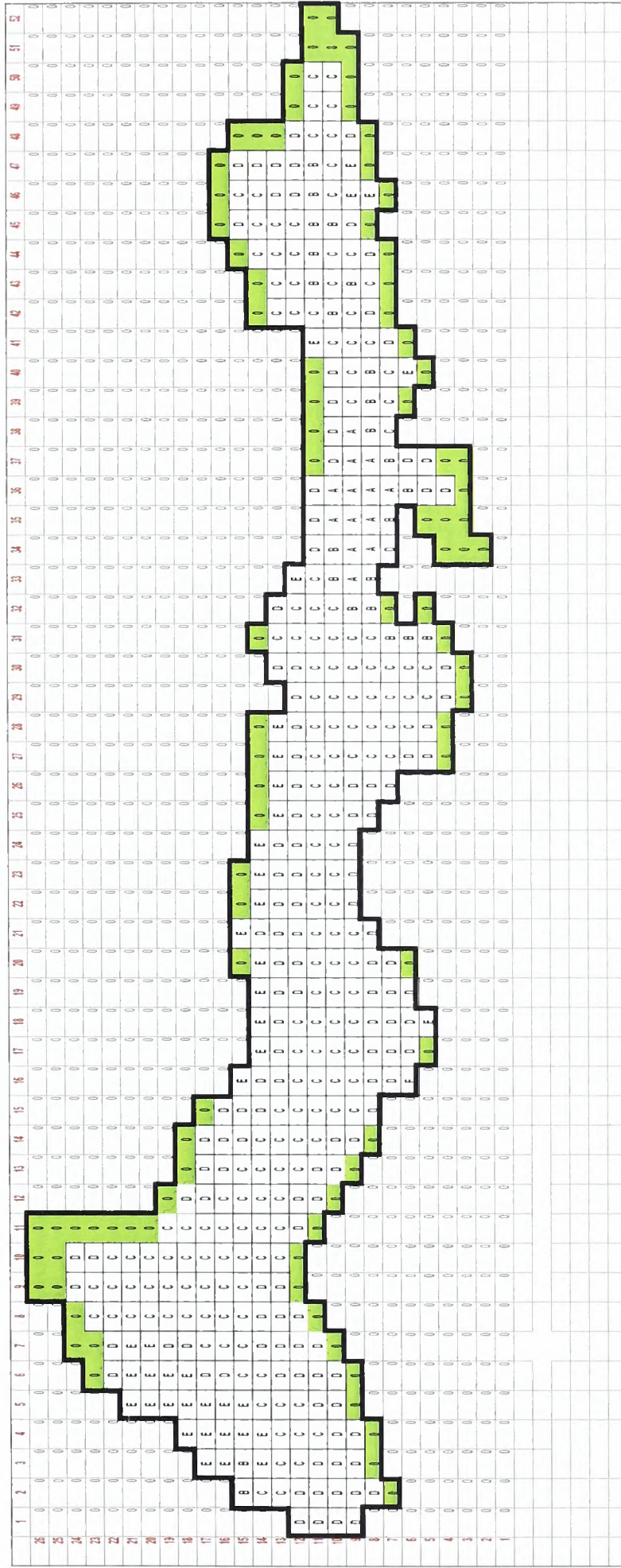
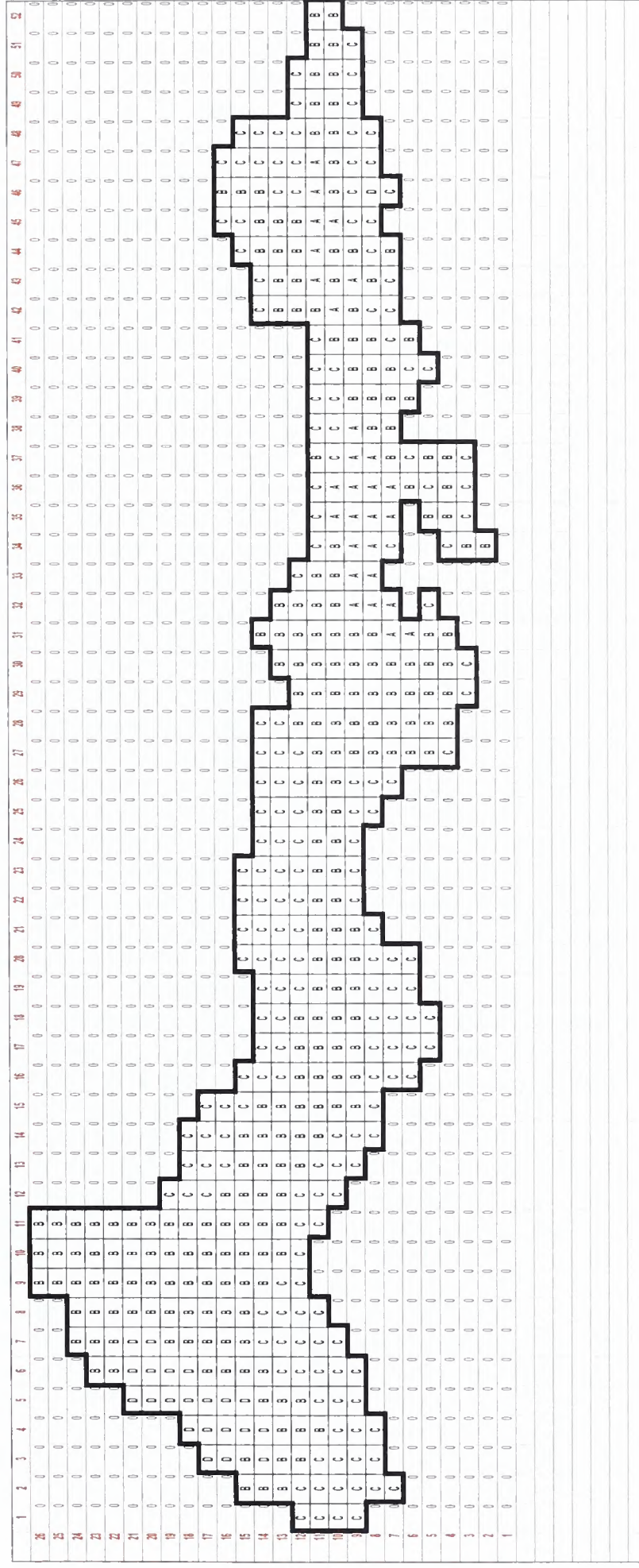


Figure 9  
Transmissivity (T) distribution (layer 3)

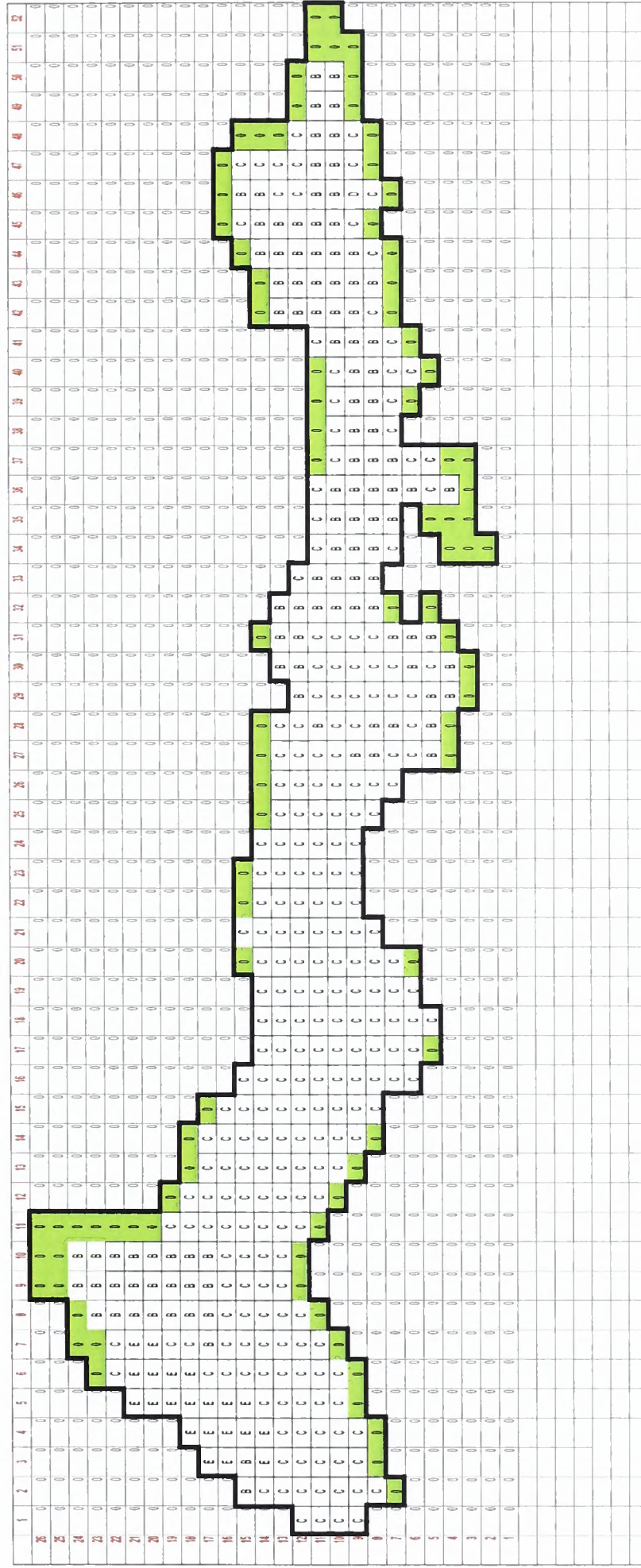




A = 1 to 99E-8 1/sec  
 B = 1 to 99E-9 1/sec  
 C = 1 to 99E-10 1/sec  
 D = 1 to 99E-11 1/sec  
 E = 1 to 99E-12 1/sec

Figure 10  
Leakance distribution between layers 1 & 2

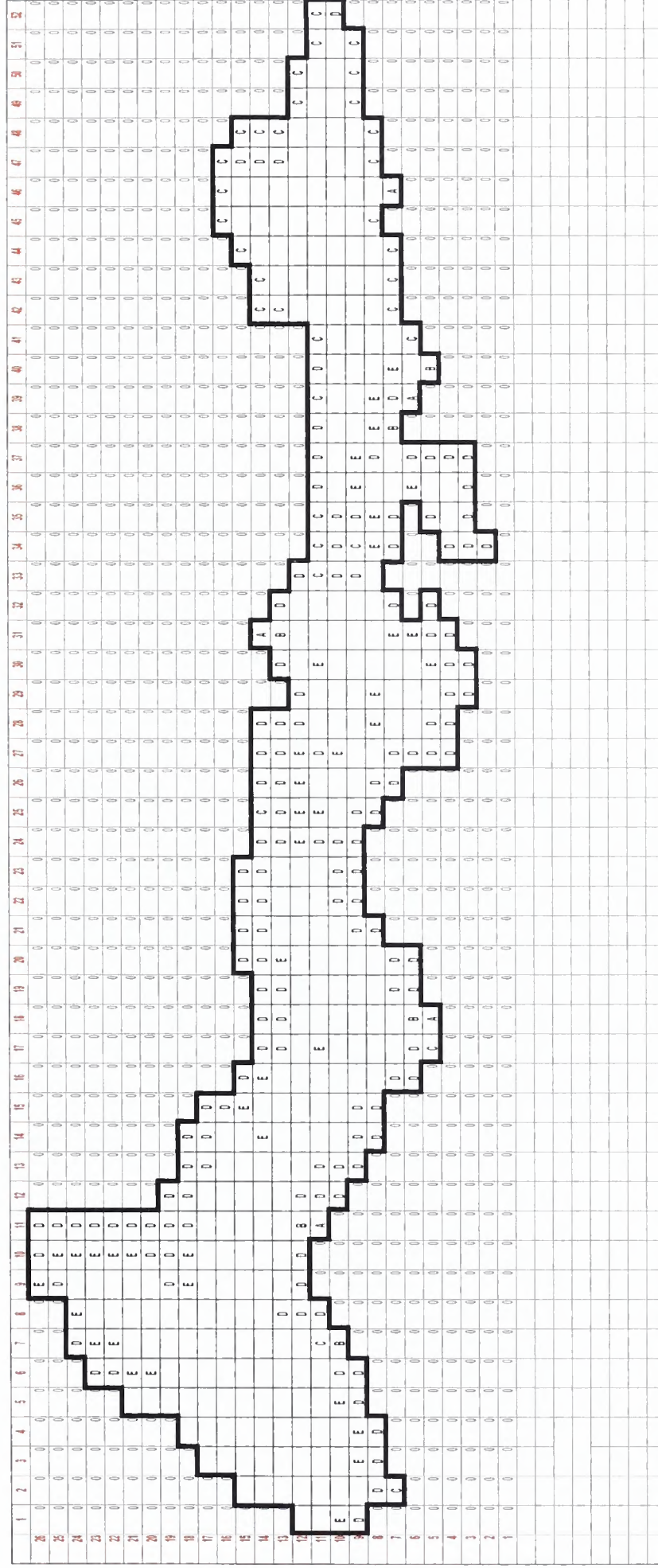




A = 1 to 99E-8 1/sec  
 B = 1 to 99E-9 1/sec  
 C = 1 to 99E-10 1/sec  
 D = 1 to 99E-11 1/sec  
 E = 1 to 99E-12 1/sec

Figure 11  
 Leakance distribution between layers 2 & 3





A = 2000-3000 AF/yr  
 B = 1000-1999 AF/yr  
 C = 500-999 AF/yr  
 D = 100-499 AF/yr  
 E = 100 AF/yr  
 Blank = 0

Figure 12  
 Recharge distribution layer 1







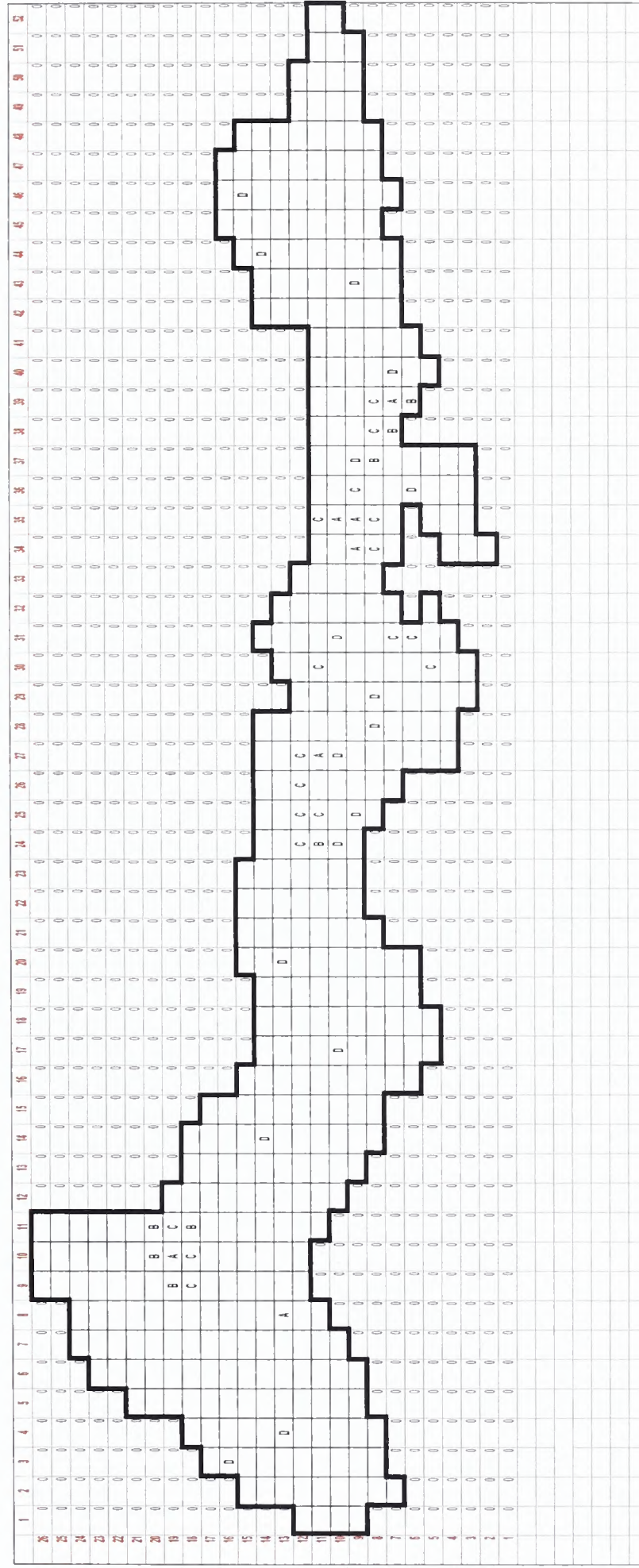
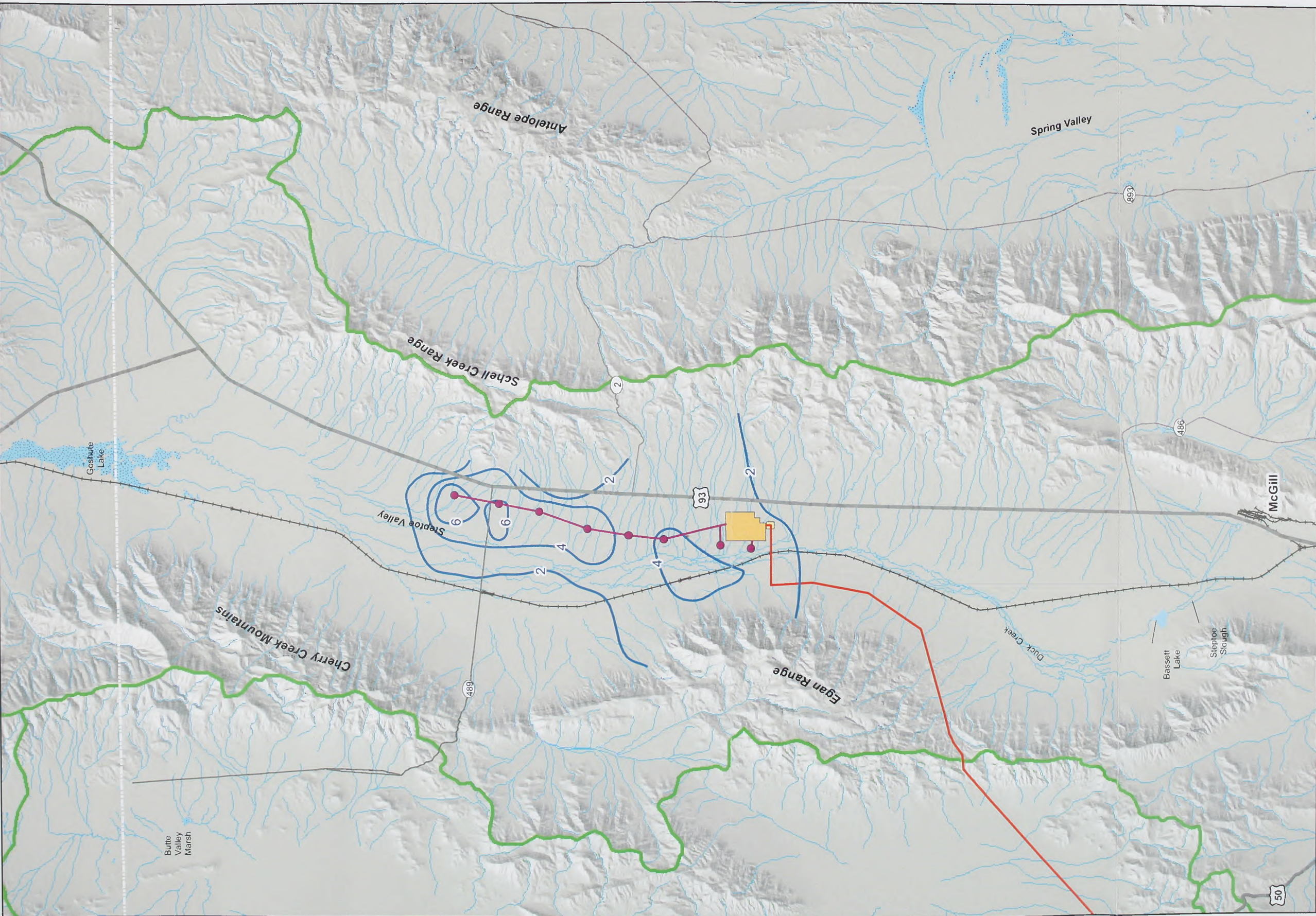


Figure 14  
Background pumping distribution





**Legend**

- Groundwater Drawdown Contours
- Proposed Well Field
- Proposed Site
- Substation
- Transmission Line
- Water Line
- Hydrographic Boundary
- Lake
- Intermittent Water
- Railroad

**Figure 15**

**White Pine Energy Station**

**Proposed Action**

**Potential Project Induced**

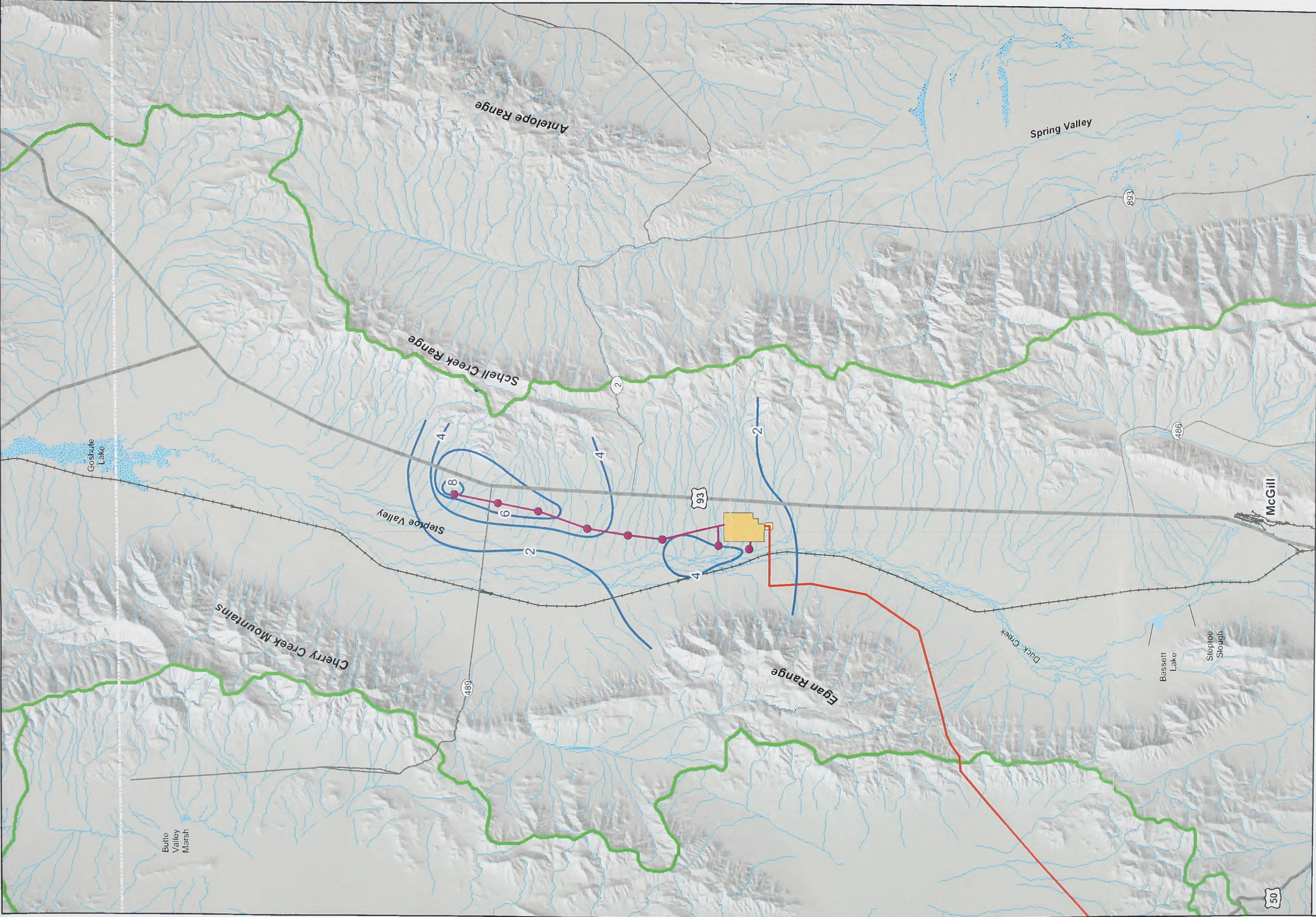
**Ground Water Level Declines**

**Model Layer 1**

0 1 2 4 Miles

CH2MHILL





**Figure 16**

**White Pine Energy Station**

**Proposed Action**

**Potential Project Induced**

**Ground Water Level Declines**

**Model Layer 2**

**Legend**

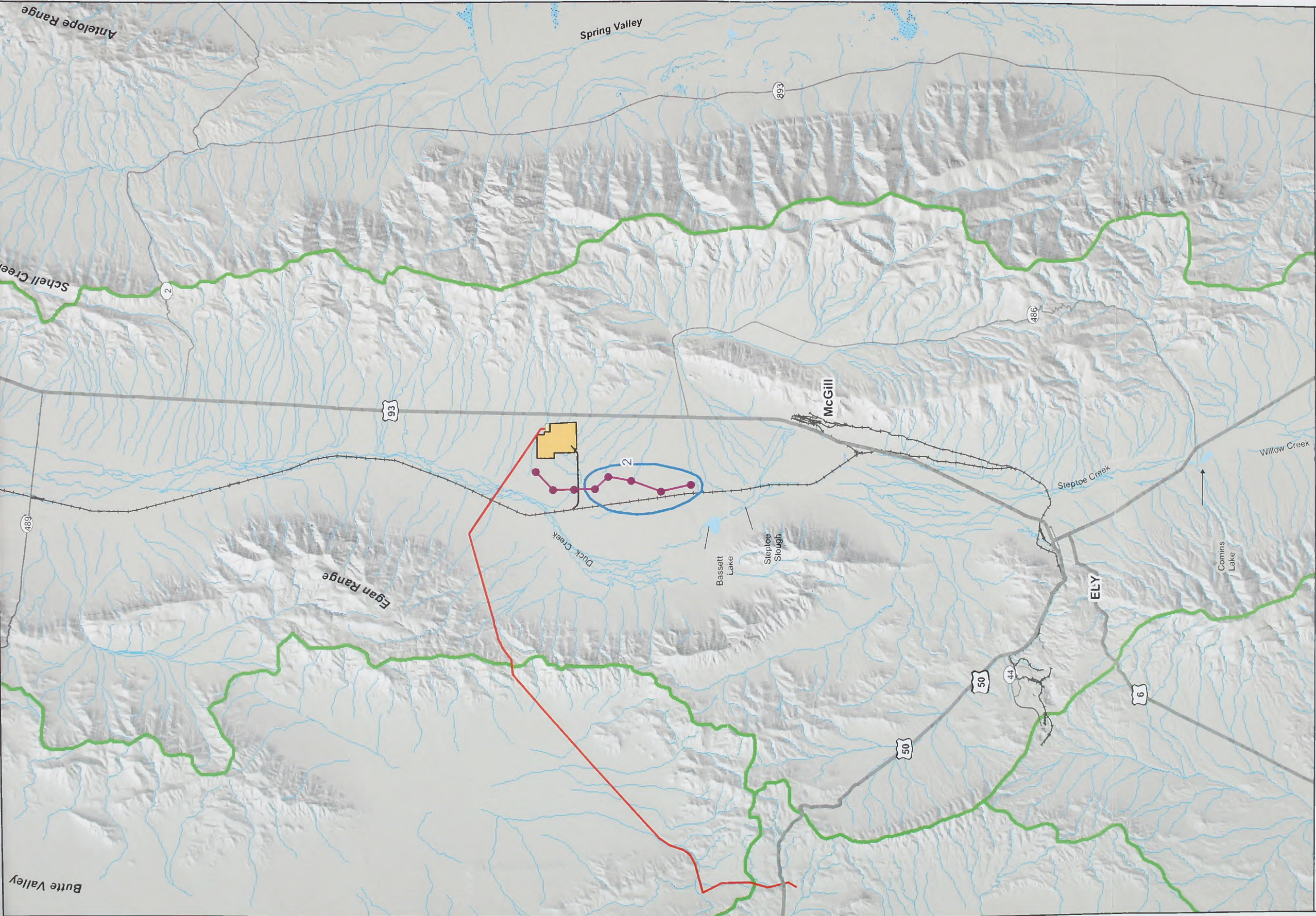
- Groundwater Drawdown Contours
- Proposed Well Field
- Proposed Site
- Substation
- Transmission Line
- Water Line
- Hydrographic Boundary
- Lake
- Intermittent Water
- Railroad

0 1 2 4 Miles

N

CH2MHILL





**Legend**

- Groundwater Drawdown Contours
- Southern Wells
- Alternate Site
- Alternate Substation
- Transmission Line
- Alternate Rail Spur
- Water Line
- Hydrographic Boundary
- Lake
- Intermittent Water
- Railroad

**Figure 17**

**White Pine Energy Station**

**Alternative 1**

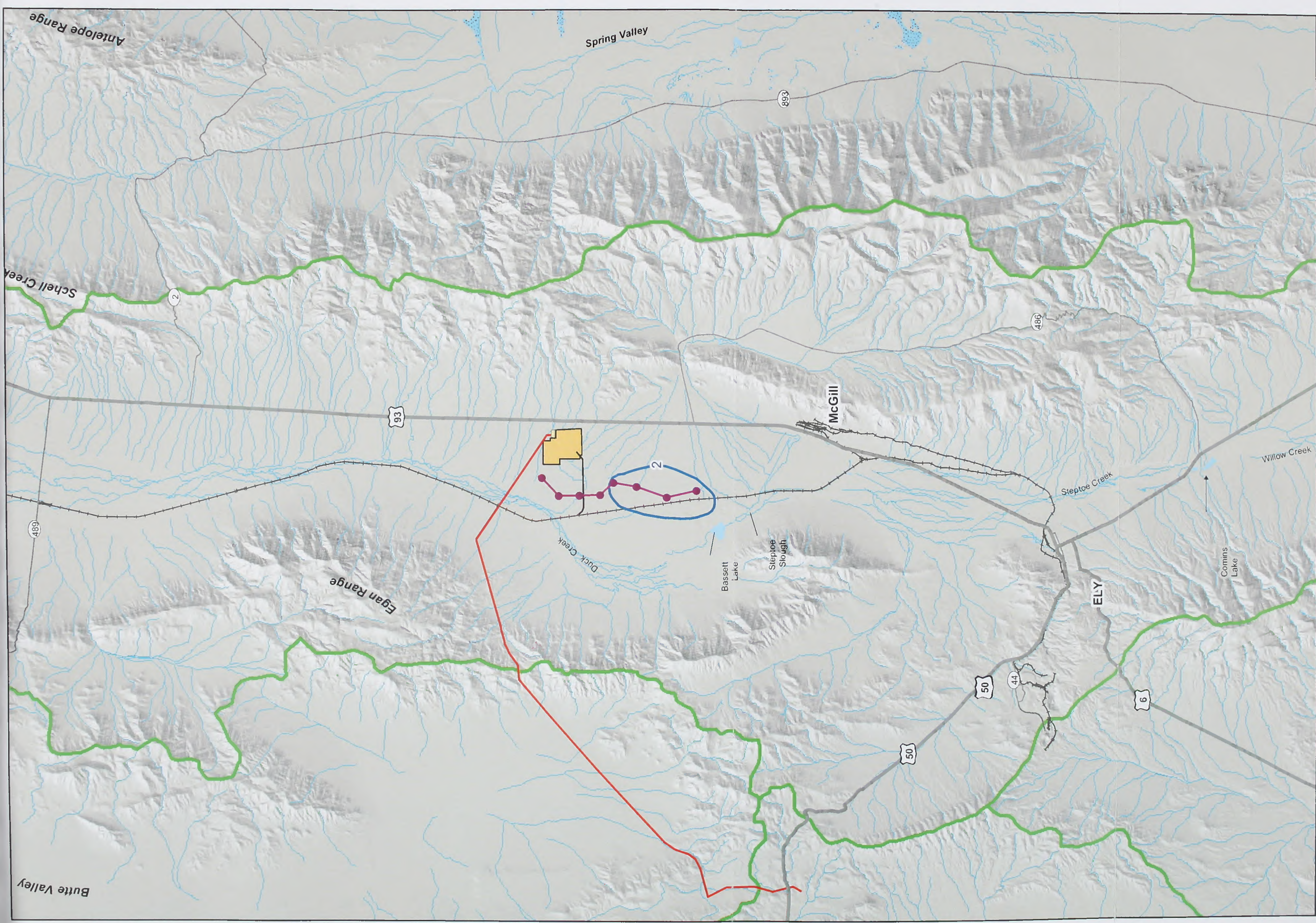
**Potential Project Induced**

**Ground Water Level Declines**

**Model Layer 1**

CH2MHILL





**Legend**

- Groundwater Drawdown Contours
- Southern Wells
- Alternate Site
- Alternate Substation
- Transmission Line
- Alternate Rail Spur
- Water Line
- Hydrographic Boundary
- Lake
- Intermittent Water
- Railroad

**Figure 18**

**White Pine Energy Station**

**Alternative 1**

**Potential Project Induced**

**Ground Water Level Declines**

**Model Layer 2**

CH2MHILL

0 1 2 4 Miles

N



Appendix I

# Ground Water Monitoring Program



## APPENDIX I

# Ground Water Monitoring Program

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The objective of this monitoring plan is to describe the water resources monitoring activities in response to the annual groundwater withdrawal of 5,000 acre-feet (af) from the basin-fill aquifer in the Steptoe Valley, associated with the proposed White Pine Energy Station (the Station) to be located in Steptoe Valley, White Pine County, Nevada. Although this demand for water would be the same for either the Proposed Action or Alternative 1, the demand would be met through the operation of two different well fields each consisting of eight water supply wells located in an approximate linear configuration on the valley floor, roughly parallel to U.S. 93 (see *Chapter 2, Description of Ground Water Resources*). Specifically, for the Proposed Action, the eight wells in the proposed well field are located at intervals of between approximately 1 and 3 miles extending from the proposed energy station location northward for approximately 12 miles. The eight wells in the proposed wellfield for Alternative 1 are located at intervals of between approximately 1 and 2.5 miles extending from the Alternative 1 energy station location south for approximately 5 miles.

The monitoring program, which would be managed by White Pine Energy Associates LLC, would document changes in ground water levels spring discharge at selected springs that could be caused by the ground water withdrawals for the Station.

## Production Wells

Discharge rates and groundwater levels will be measured in each of the production wells on a continuous or frequent basis, as is feasible, using permanent recording devices. The water levels would be measured during pumping and non-pumping periods.

Depth to groundwater will be measured in all production wells daily using pressure transducers or sounding probes. Each production well will be equipped with a flow meter to record cumulative water production. Cumulative well production will be recorded at least monthly. All monitoring data will be entered into a project database maintained by White Pine Energy Associates LLC.

## Monitoring Wells

A network of up to ten monitoring wells will be installed and monitored for water level change on a minimum quarterly basis. The specific locations of the monitoring wells have yet to be determined. All of the wells would be located on public land or property owned by White Pine Energy Associates LLC. The wells would be constructed with screen intervals sufficient to monitor both shallow (unconfined) ground water levels that could influence spring discharge, and deeper ground water that is more representative of existing water supply wells completed in the basin-fill aquifer system in Steptoe Valley. The specific locations and well construction details will be presented in a plan to the Office of the Nevada State Engineer.

Groundwater levels will be measured continuously, as is feasible, using dedicated recording devices in selected monitoring wells. For those monitoring wells without continuous monitoring instruments, water levels will be measured quarterly initially to establish seasonal variations, followed by semiannual or annual measurements after seasonal trends have been established.

White Pine Energy Associates may determine that additional monitoring well(s) should be installed in areas where there are no existing or proposed wells available for monitoring. These additional wells will be located and constructed in a cost-effective manner, while meeting the objectives of early-warning detection of impacts, if any, from proposed groundwater extraction.

Initiation of groundwater level monitoring will commence as soon as possible, recognizing the desire to obtain baseline data prior to groundwater extraction.

## Elevation Control

Ground surface and measuring point elevations will be measured at each production and monitoring well using a survey-grade GPS instrument. All elevation measurements will be added to the project database that contains groundwater level data.

## Springs

Selected springs in Steptoe Valley will be monitored quarterly. Monitoring will consist of measuring flow rate and photo-documenting general site conditions. Flow will be estimated for low flow conditions or where the flow is diffuse on the ground surface. Monitoring frequency may be reduced later as appropriate to semi-annually or annually.

Initiation of monitoring for springs will commence as soon as possible, recognizing the desire to obtain baseline data prior to groundwater extraction. Monitoring data will be recorded using a standard format to be used for each monitoring event.

## Water Quality

Groundwater quality samples will be collected from all eight production wells and selected monitoring wells, and analyzed by a laboratory for major ions and trace elements.

Specifically, the following parameters will be measured in each water sample:

- **Field Parameters.** Water temperature, pH, oxidation-reduction potential (ORP) and specific conductance.
- **Common Ions.** Calcium, sodium, potassium, magnesium, chloride, fluoride, sulfate, bicarbonate, nitrate, total dissolved solids, and total suspended solids.
- **Trace Elements.** Arsenic, barium, copper, iron, lead, manganese, and zinc.

More extensive water quality analysis will be performed for samples from the production wells to meet Safe Drinking Water requirements. Samples will be collected and analyzed

quarterly from the selected wells for the first 2 years of production well pumping to establish seasonal variations. Thereafter, the wells will be sampled and analyzed semiannually (spring and fall).

Frequency, sampling location, and water quality parameters will be reviewed annually and may be reduced or expanded in scope upon its recommendation the State Engineer.

## **Reporting**

All data collected under or as described in this Plan will be reported to the Office of the Nevada State Engineer on an annual basis. In addition to updating the water resources project database on a regular basis, an annual summary report will be prepared by White Pine Energy Associates LLC that summarizes all information collected during the previous calendar year, including an analysis of any trends.





